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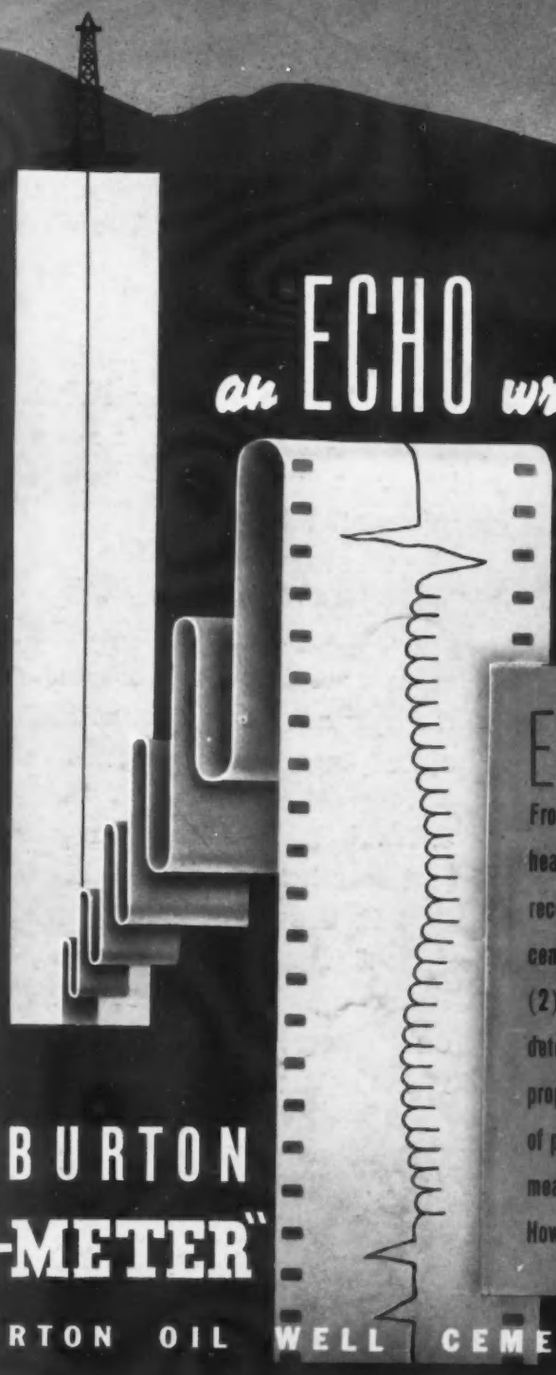

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LOOKING AHEAD

WITH THE EDITOR

THE YEAR 1940 was a significant one for the oil industry, and 1941 promises to be equally important. Therefore, a review of the past year's developments and a prediction based on the prospects for the new year is of vital interest to all oil men. This is the "theme" of the Annual Yearbook-Forecast Number to be published next week. We believe this will be the most interesting and valuable collection of statistical and economical data on the oil industry's annual record yet published.

It should serve as a handy reference to those who might seek to find answers to any of the following questions:

Important Statistics

1. How much oil was produced in any given country, or in any state or field of the United States, during the past year, and their individual cumulative volume?

2. How many wells were drilled in any specified district of the United States last year, the amount of footage drilled; and whether these were up or down from the preceding year, and what is the prospect for drilling activity during 1941?

3. How many new fields were discovered during 1940 in the United States; where were they located, and how did discoveries compare with preceding years?

4. How much new crude-oil reserves were found in the United States during 1940, or in any state, and how did this compare with previous years?

5. Where were new trunk pipe lines laid during 1940, by whom and what size were they?

6. How many tests have been drilled to 10,000 feet or deeper, or what is the world's record for deep drilling? How many fields produce from below 10,000 feet?

Answers to these and many other questions will be presented in THE OIL WEEKLY's Annual Yearbook-Forecast Number next week. Occasionally during the year you may want to know the answers to these or other petroleum economic questions. If so, remember to obtain a copy of the issue of January 27, 1941, and to save it for future reference.

Annual Index

In addition an annual index to all the feature articles, and many of the important news items, of the year will be published next week.

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THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

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The Oil Man's Calendar

FEB.	
22	American Institute of Mining & Metallurgical Engineers, New York.
22	North Texas Oil & Gas Association, Wichita Falls.
24–25	Liquefied Petroleum Gas Association, Chicago.
27–28	American Petroleum Institute, Division of Production, Southwestern District, Shreveport.
MAR.	
11	American Petroleum Institute, Division of Production, Spring Meeting, Pacific Coast District, Los Angeles.
APR.	
1– 3	Society of Exploration Geophysicists, Houston.
2– 4	American Association of Petroleum Geologists, Twenty-sixth Annual Meeting, Houston.
7–11	American Chemical Society, St. Louis.
16–18	Western Petroleum Refiners Association, Hot Springs, Ark.
17–18	American Petroleum Institute, Division of Production, Eastern District, Pittsburgh.
23–25	Petroleum Industry Electrical Association, Tulsa.
23–25	Natural Gasoline Association of America, Dallas.
24–25	National Petroleum Association, Semi-Annual Meeting, Cleveland.
25–26	National Petroleum Association, Cleveland.

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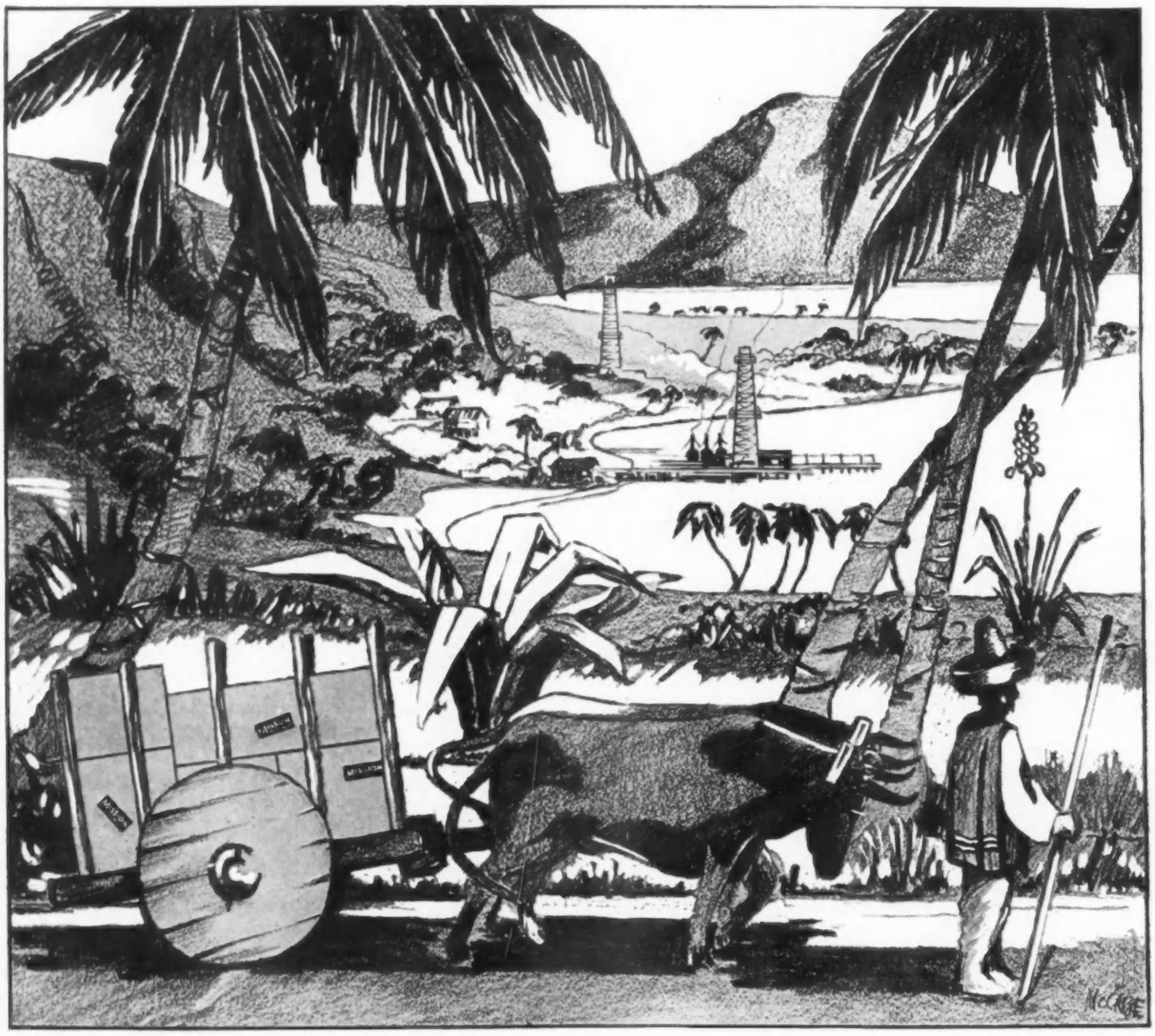

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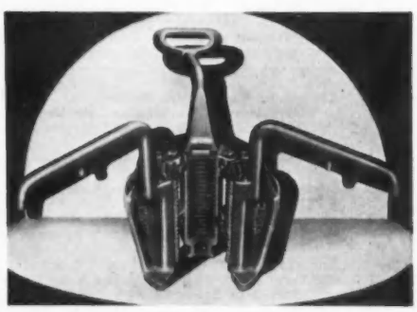

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THE OIL WEEKLY

JANUARY 20, 1941

VOLUME 100 NUMBER 7

The Changing Panorama

Commission Strengthened . . .

The recent decision by the United States Supreme Court in the Rowan & Nichols case greatly strengthened the position of the Texas Railroad Commission in all oil proration matters. In reversing the lower courts, the Supreme Court inferred that although the railroad commission might not be perfect in every detail, it could and should be a fair and impartial agency, by which equitable proration orders are issued. It further stated such proration must be administered by a responsible body of some kind, and that the railroad commission was that body in Texas.

Thus the United States Supreme Court has given the Texas Railroad Commission exactly the power it wants in proration matters. The railroad commission now has the opportunity to display fairness to all, as it interprets fairness, without serious fear of reversal at the hands of the highest court in the land.

Certainly the railroad commission will make mistakes, but any policy it may have that is aimed at fairness and based on sound engineering and economics will help to give an equitable administration to the oil industry in Texas.

A few weeks ago the commission indicated that it had to give special allowables, under the law, if the person seeking the allowable could produce evidence of market demand. It does not have that excuse now.

Anti-American . . .

An Argentine made film "Petroleo," shown in the Buenos Aires theatres, is attacking American oil companies. It has been rumored that the script was based upon the struggle between an American and a German oil company for a concession in Argentine Patagonia; but that the Argentine state oil company (Yacimientos Petroliferos Fiscales) had told the producer that "attacks against Germany were not convenient."

Attacks against American companies obviously are, as the script was changed so that it shows the fight of a patriotic Argentine assisted by a blue-eyed Herr Doktor against the intrigues of not only one but two American companies. Both are domicilated in the Buenos Aires building of the First National Bank of Boston which is actually shown in the picture and where many American companies have really their offices. One company engages the services of a nondescript vamp "Sonja."

Needless to say that, in the end, the dapper Argentine assissted by his Teutonic friend is victorious in his fight against the nasty Americans.

Fine! . . .

We have not checked up on the arithmetic, but we were told the other day that if the federal government should collect all the penalties possible to assess under the anti-trust suit filed against 39 leading oil companies and several hundred subsidiaries, it could total as much as $8,000,000,000—yes—eight billion dollars. And would *that* put the government in the oil business!

Trained Men . . .

The industry will be furnishing many trained men—technicians, engineers, chemists—to the preparedness program. A recent and specific call is for men capable of testing lub oils, gasoline for knocking characteristics, other petroleum products to determine their specifications.

A definite call has been made for such men and to train them especially for government needs, 45 schools and universities are offering laboratory work and lectures. Qualifications are not too strict. Two years of university work are desirable although this can be substituted for by practical experience.

Resignation in Order . . .

Around the state capitol in Austin there is considerable criticism against Colonel-Commissioner Thompson of the Texas Railroad Commission, because he continues to hold the job of railroad commissioner the while he is attending to his active duties in the army. Some have been unkind enough to say that they do not see how the colonel can attend to the busy job a railroad commissioner has, and that the commissioner cannot possibly act as commissioner and attend to the job of being an active colonel. The situation should be cured by a resignation. It may be cured with a bill.

California OUTPUT CURTAILMENT

By A. H. BELL
Chairman, Conservation Committee of California Oil Producers

IT APPEARS that few oil men outside of California have accurately appraised what this state has accomplished in the matter of proration and conservation. From time to time, attention is called to California and its supposed part in placing the industry in a position where some form of federal control may be made to appear necessary to protect the public interest in the nation's oil reserves. With the new Congress in session and the Administration actively interested in bringing the oil business under its management, ostensibly in the interest of national defense, and the safeguarding of an adequate supply of a critical war material, it is very necessary that the industry — at least — should be advised of the situation in California.

With a potential standing at 3,300,000 barrels daily, 1940 average production of crude oil in California stood at about 609,220 barrels daily. The demand for petroleum products in California's domestic and offshore marketing areas during the year was considerably greater than the state's production. This differential was translated into a net reduction of 6,209,000 barrels in inventories of all products during the first 11 months of the year, according to Bureau of Mines statistics, while data for the final month of the year, when available, is expected to show a further substantial reduction.

These data show, then, that producers on the West Coast held their output within the limits of marketing requirements, and, in addition, worked off a considerable volume of the state's surface inventories.

Held to One Fourth of Potential

Since production is not running "wild," and the new supply of crude is actually somewhat below refining requirements, what then is so offensive in the California production picture? So far, oil operators in this area have failed to find flagrant disregard of production quotas established under the state's voluntary proration system. On the contrary—it is very doubtful if any oil state operating with or without benefit of state legislation can show a cleaner production picture than that to be found in California.

The state's operators maintained their production at less than a fourth of their capacity to produce last year. They find it difficult therefore to reconcile reports of waste and disregard of responsibility in the state's oil fields while contributing to a voluntary conservation program the difference between their actual output during last year and the capacity of their wells to produce.

The showing made in 1940 under a purely voluntary conservation system wherein there are no legal bars to limit output was not unusual. It was rather a continuation of a system that has been in operation for more than 12 years wherein the producers have had an opportunity to evolve their own system of proration. Through all this period the industry has approached the proration problem with an open mind, seeking to develop an equitable and practical method of distributing to each well, property, field, and producing district its proportionate share of the available market for oil.

In 1932 and again in 1939 efforts were made to place on the statute books of California a law to control oil production. In each instance some of the producers favored such a measure and some opposed it. The 1939 campaign was one of the most heated in the history of California politics. While the bill was being debated before the people, however, both those for and those opposed worked together smoothly under the state's voluntary proration system. Had either of the bills been enacted it is unlikely that any appreciable change would have been made in applying proration.

"Uniform Method" of Curtailment

The system now in effect has been in operation since June of 1939 and is termed the "uniform method" of curtailment. It is the result of many years of study by many engineers. In the absence of mandatory regulation enforceable in the courts, it was necessary for the industry in California to find a system so scrupulously fair that landowners, royalty owners, interest holders and the operators could all agree to its application in the sure knowledge that every interest was being treated fairly and equitably. In working out the present system to a point where it is successfully applied—and has been successfully applied for over 18 months—the California producer feels that he has made a major contribution in the field of petroleum conservation.

The Canadian government recently recognized the advanced methods of conservation which have been developed by California producers in their choice of R. E. Allen as chairman of their Petroleum Conservation Board. He was active in the administration of proration in California from 1929 until 1936, when he resigned to enter private industry.

Unwarranted Attack

The most recent attack upon California and its conservation status appeared in the January 4 issue of *The Saturday Evening Post,* titled "Oil War Over Here," under the signature of Ruth Sheldon. This writer declared:

> *"Although no testifying government officials offered proof of great waste, or proposed to handle conservation by methods other than those already developed and used by the majority of the industry, they rightfully made great capital of two glaring examples of the need for regulation—Illinois and California. Oil men can only hang their heads when these two states are mentioned. Neither has laws regulating production, and all efforts toward conservation have been repeatedly defeated. With Cali-*

RECORD IS COMMENDABLE

Under Voluntary Committee Rules

A. H. BELL

General Superintendent in charge of the production department of Continental Oil Company, in California, got his start with the Associated Oil Company in 1915 as refinery engineer at San Francisco, later being transferred to Kern River to handle the electrification of numerous pumping wells.

In 1918, he joined Empire Refineries at Bartlesville, Oklahoma, and served as refinery and production engineer, assistant general superintendent of production and chief production engineer. Joining Pierce Oil Company in 1921 as chief engineer he handled the reconstruction program for that company in the Mid-Continent and Mexico, going to California in 1926 as chief production engineer for Marland Oil Company, later becoming production and general superintendent of Continental Oil Company following the consolidation of the two companies. He is chairman of the Central Committee of California Oil Producers and has been a leader in the oil curtailment program for the past ten years.

fornia the second largest oil-producing state and Illinois third, both combined producing 27 percent of the nation's oil, the industry's argument that the oil states properly can deal with conservation is weakened.

"These two states indulge in the industry's disreputable early-day practices. Illinois is the worst offender, as there has been a voluntary agreement among most California producers. Illinois wells are allowed to run wide open, quickly exhausting gas pressure, so that quantities of oil can never be recovered. Wells are drilled so closely together as pins on a completely filled pincushion, thereby draining an oil pool too quickly and ultimately losing oil that could have been recovered by sane drilling practices. Major companies which practice and support conservation in other states hypocritically produce to the utmost in Illinois and California."

After reading this sort of indictment of California's producing activities, the operator who has sacrificed for years to keep the program effective and operating successfully begins to wonder as to the source of the author's information.

Demand at All-Time Peak

Accompanying the November statistical report of the Bureau of Mines on the petroleum situation in the Pacific Coast territory was a statement prepared by the Petroleum Economics Division of the Department of the Interior which pointed out that "domestic demand for all petroleum products in the five Pacific Coast states reached an all-time record, 561,000 barrels daily in November. This is an increase of 26,000 barrels daily over October domestic demand and an increase of 63,000 barrels daily over November, 1939, demand," the statement declared. Gasoline-bearing and non-gasoline-bearing crude production in California for November was listed in the same statement at 607,700 barrels daily, an average 24,700 barrels daily in excess of the state's recommended quota as detailed in the Bureau of Mines forecast for that month.

Consistent Stock Withdrawals

These data are significant because they show that there has never before been greater requirements in the domestic marketing area for California production than now, but despite this pick-up in demand, the production trend in California continues downward. Offsetting somewhat the increased domestic requirement has been a small decrease in the over-all volume of oil moving offshore from California to inter-coastal and foreign markets. Data on inventories offer evidence, however, that the decrease in offshore movements has not been of heavy proportions. These statistics point to the fact that conservation as practiced here has been proportionately more effective than state-administered programs in other oil producing areas, as a survey of the national picture will show.

In this connection, it is of interest to note that in a comparison of actual production and Bureau of Mines' estimates of crude-oil demand with an analysis of changes

in crude-oil stocks, issued by the Independent Petroleum Association of America, covering the months of September, October and November, 1940, California was the only major oil-producing state to reflect consistent stock withdrawals. In September, for example, stocks east of California decreased only 3500 barrels daily, whereas the industry in California reduced stocks 34,400 barrels daily. In the first two weeks of November the report details a decrease of 127,800 barrels daily east of California; while in that month California alone decreased its inventories by 40,500 barrels daily.

While not attempting to detract from the conservation efforts in other oil-producing states, these statistics offer practical evidence that the production situation in California under its voluntary system of proration is not out of hand and is not of a nature to demand outside force to remedy it.

California has pioneered in the matter of state laws for conservation purposes. The act of 1915 to prevent water infiltration and underground waste has long been a model for other states and countries. About 10 years ago a gas conservation law was passed which prevents unreasonable waste and has effectively promoted the conservation of gas energy in oil fields of the state.

Loss of Offshore Markets

California operators have been concerned about only one factor in their economy for the past year, that being the possibility of loss of offshore markets to Japan. This market has been supplied by California production for more than 50 years and has been an important factor in the industry's economy in this area. Last year the embargo on aviation grade fuel made a slight reduction in shipments to that destination, running to more than 5 percent of the total business. Many politicians have been prone to censure California oil men for their continued shipment of petroleum products to Japan. They fail completely to recognize the responsibilities of California producers to continue to supply the requirements of Japan so long as it suits the pleasure of the American State Department to make American oil available to that country. Apparently the State Department takes the view that, in the absence of a supply of oil from California, Japan will find supplies—by force if necessary—elsewhere. Whenever Washington bars the shipment of American crude oil to Japan or any other foreign country, such action will receive support of the West Coast oil industry.

To familiarize producers in other oil states with the system that has been developed for proration of production in California after 12 years of work on the subject, the following brief summary of the method now used is presented.

Depth Proration Factors

Under the present system, which was first applied in June, 1939, only two factors are used to determine the allotment of oil to every well in the state; potential production and total depth. Under this system every well in the state, regardless of size, location, or gravity of oil produced is placed on an equal footing. The allotment actually assigned to each well every month determines the sum total of allotment assigned to every property, field, and pool in the state, openly arrived at on a basis of equal parity.

This formula embraces three principles. First of these is the use of a top allotment which for June, 1939, was set at 250 barrels daily for the largest wells in the state. Setting of a top allotment provided for a reasonably early return of capital investment in new flush wells and at the same time the surplus potential over and above the amount required to place a well in the maximum classification was eliminated from calculations and accordingly provided for a greater proportionate allotment to wells below the top.

A second principle enunciated by the plan was the establishment of a minimum allotment for all wells. This took the form of an allotment of 5 barrels daily for the first 1000 feet of well depth, 6 barrels daily for the next 1000 feet of depth and 7 for the third, etc. Wells in the marginal classification are automatically exempt from curtailment and may be defined as those whose individual potentials are equal to, or less than, the minimum allotment determined by their depth.

A third factor provided for the distribution of the remainder of the state quota to the intermediate wells, that is, wells that were neither top wells nor marginal wells. The potential remaining after deducting the minimum was distributed on a power factor basis using an 0.76 fractional exponent of the remaining potential. This power factor method merely made use of the sliding scale method similar to the income tax principle, thereby placing the curtailment load on wells best able to carry it.

These three principles embodied in the uniform formula have continued in effect. Gradual changes have been made in these factors as required due to the completion of many new wells since the first formula was applied. New potential has been added at a rate in excess of the natural decline of all old wells and consequently it has been necessary to progressively reduce the amount of oil assignable to the old wells. Accordingly, in January, 1941, the top allotment stood at 148 barrels daily, as contrasted with 250 barrels daily in June, 1939. The minimum allotment has also been slightly modified and less depth allowance is given deeper wells. The power factor likewise has been reduced periodically. In July, 1940, a compound power factor curve was introduced and is now applied. This lessens the cut to the small wells and prevents oppressive curtailment of this class of well. Another effect of the compound power factor has been the requirement of greater potential for a well to quality for a top allotment.

The objective sought through the use of a uniform formula was to place the burden of curtailment on the shoulders of those most able to carry it, to give a living wage to the small well, and to realize uniformity of methods.

Administration of California's curtailment program is in the hands of the Conservation Committee of California Oil Producers. This committee is made up of 34 members, 29 of whom are chosen directly by vote of individual producers in 29 fields and producing districts, and 5 of whom are elected by the conservation committee following open nominations from the floor at its organization meeting. The 29 field or district committees are chosen in district elections, ballots being distributed to each producer for nominations for field committee members, chairmen and alternates. The number of committeemen in each field or district must represent 10 percent of the total number of operators and, in any case, not less than 5 members to a field or district. The chairman chosen in each district is the conservation committee representative from that area, the vice chairman serving as an alternate member.

The conservation committee has

three standing sub-committees, the allocation, administrative and new well committees. Most active of these sub-committees is the allocation committee, whose function it is to calculate and recommend the allocation of quota to the various wells and fields of the state, submit findings to the main committee, and in general review engineering practices in use. Its meetings are open to all members of the industry and minutes of its proceedings may be reviewed. The administrative committee is concerned with policy matters and administration of the administrator's office. This committee passes upon disbursements, personnel policies and general office organization details. The new-well committee's objective centers around the elimination of drilling of unnecessary wells.

The oil administrator is appointed by the conservation committee and it is his function to secure the utmost cooperation of operators.

Factual data on the successful application of this voluntary proration system were presented before the Cole committee at its hearings in California a year ago. Testifying before that group, L. L. Aubert, chairman of the allocation subcommittee, placed in the record data showing that 18,554 wells were capable of production and entitled to receive allotments in December, 1939. Of this number, Aubert testified, 9918 were marginal wells with potential of 89,858 barrels daily and assigned an allotment of an equivalent amount. Intermediate group wells numbered 7961, with aggregate potential of 847,087 barrels a day and were assigned an allotment of 370,492 barrels daily under the uniform formula then in effect. Top wells at that time totaled 675 and had an aggregate potential of 1,586,087 barrels daily and received an allotment of 137,700 barrels daily.

Potential represented by marginal wells comprised but 3.5 percent of the state total, Aubert's testimony stated, intermediate wells 33.6 percent of the total and top wells, 52.9 percent. The marginal group of wells under the uniform formula were assigned 15 percent of the state's total allotment; intermediate wells 62 percent; and top wells 23 percent of the total allotment for all wells.

Application of this system, he continued, practically silenced all arguments between field committees relative to inequities of allotments.

The witness reviewed for the Cole committee the first 7 months of operation under the uniform formula in California, or the period from June 1 to December 31, 1939. He stated: "I would like to give you a comparison of the situation that existed at the time of the NRA with the conditions that existed between June 1 and December 31 of this year. I will refer first to the NRA period and secondly to the uniform formula period. The number of wells under the NRA period in California were 15,280. The number of wells under the uniform formula period were 18,550. Percent of increase in wells, 21.4 percent. The number of fields under the NRA period were 76, and under the uniform formula period, 93, an increase in the number of fields of 22 percent. The state allotment under the NRA period was 472,800 barrels a day; under the uniform formula period, 598,000 barrels a day, an increase of 25.8 percent and the state production during the NRA period was 479,100 barrels per day. The state production under the uniform formula period was 609,500 barrels per day, an increase of 27.2 percent. The state potential during the NRA period was 1,400,000 barrels per day. During the uniform formula period, the state potential was 2,523,000 barrels per day, an increase of 80 percent. From the above figures it appears that the task of obtaining compliance with allotments during the past 7 months has been increasingly difficult by reason of the tremendous increase in the state's potential, but that nevertheless compliance with the state allocations under our voluntary system has been carried out."

Since Aubert testified before the Cole committee, another full year of operation under the uniform formula has been entered on the record books in California. In that year average production, as stated earlier, averaged 609,220 barrels daily; potential capacity at the end of the period stood at 3,300,000 barrels daily; and further drilling had increased the total number of producing wells to 19,334. These data do not indicate a situation for which the oil industry in California or elsewhere need apologize.

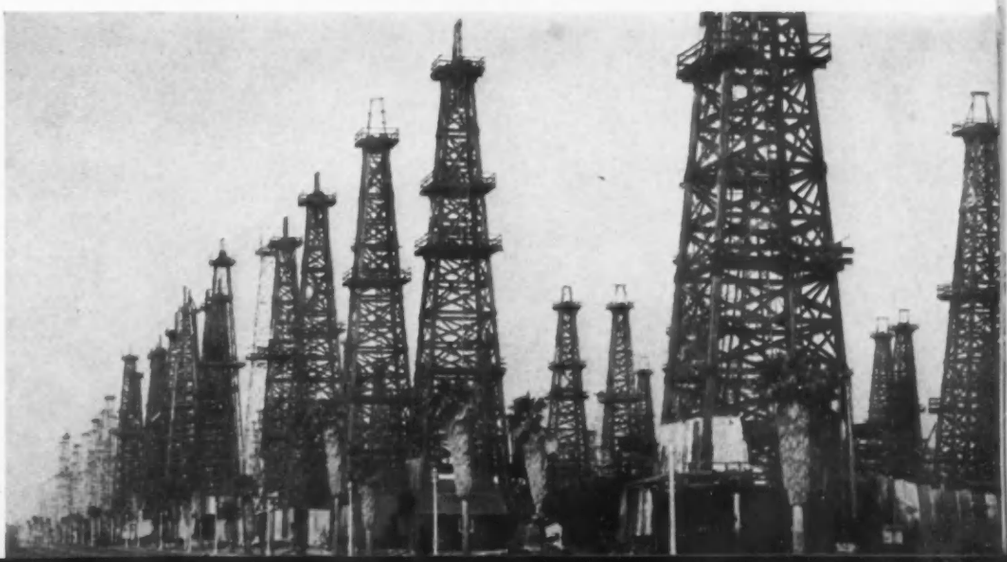
As indicated in potential statistics, the productive capacity of California fields has been more than doubled over the past few years. Upon discovery all new fields have been subjected to immediate and heavy curtailment. Actual unit development arrangements, or semi-unitized plans, have been applied with the result that well spacing has been limited in many instances to 1 well to 20 acres; in others 1 to 10 acres. Included in this development has been one town-lot field, Wilmington, and even here liberal well spacing is practiced.

Not Too Close

Visitors to the Los Angeles Basin oil fields often leave with the impression that wells are wastefully drilled too close together. However the fact that the wells are drilled to several different zones totaling several thousand feet in thickness give a per-acre-foot spacing much more conservative than practiced in the average oil field east of the Rocky Mountains. Recoveries to date in excess of 400,000 barrels per acre bear out this statement.

The desire for news causes the publication of stories about this or that operator or field that does not follow the proration schedules but in no case does the dissenting operator produce his wells wastefully.

The oil operators of California who support proration and conservation do not feel that they should be condemned for wasteful methods when they so produce their wells that the 1 percent of overproduction on the state's potential still leaves the total for the state within demand for their product.



Drilling Wells Horizontally

By LEO RANNEY

Horizontal drilling for oil — sometimes referred to as mining—has been pioneered in Ohio. The procedure, employing a shaft sunk into the ground with holes drilled horizontally from a point near the bottom, is also used for water recovery, and to remove hazardous gas from coal deposits. This discussion of horizontal drilling progress was presented January 10 before the American Institute of Mining & Metallurgical Engineers at Los Angeles.

IN THE extraction of fluids from the earth, the larger the exposed productive area the more copious will be the flow. It makes no difference whether the fluid be oil, water or gas. From time immemorial, the common practice has been to recover fluids by drilling vertical wells into or through the productive horizon. Thereby the exposure of the producing formation is limited in length to the thickness of the bed.

Oil wells are often drilled 5000 deep to penetrated 50 feet of productive sand, so 99 percent of such a well is a total loss, insofar as production is concerned. In water wells the percentage of useless hole is much smaller, because the wells are shallower, but due to a short radius of influence, high velocities of inflow, encrustation and sanding up, vertical water wells leave much to be desride.

If it is at all possible, why not drill wells that are 100 percent productive, instead of 1 percent? Then to recover oil, why not drill horizontal wells instead of vertical ones? Twenty-five years have gone into the working out of this problem, and horizontal drilling is now an accomplished fact. In the development of the method, some 7500 feet of horizontal wells have been drilled in rock.

The first horizontal well was drilled into an old outcrop of the First Cow Run sandstone in Morgan County, Ohio. This well was 2⅝ inches in diameter and had two branches, one to 802 feet and the other to 953 feet. The hole was turned up or down at will, and was never out of control. Not a single whipstock was used. At 802 feet, the shorter branch of the well was three inches above the mouth. The other branch was turned into another substratum, then kept level to the end.

Saturation of the sand averaged less than 15 percent, and authorities on the subject, who analyzed the cores, reported that because of low saturation, no oil could be recovered by conventional methods. Yet, after the well was shot, when it had been on production for 6 weeks, daily recovery of oil was at a rate greater than the combined

Six horizontal wells flow by gravity to bottom of the shaft shown above.

A single horizontal well yielded one thousand feet of core shown at the left.

rate of the 50 nearest producing vertical wells in the field.

The oil flowed from the well by gravity.

After this encouragement, a concrete-lined shaft was sunk, 800 feet back from the first well, and 200 feet from another outcrop. A working floor was built eight feet above the concrete bottom, and an enclosed tank was lowered into the sump, this tank to receive oil produced with the drill water. An electrically operated, specially built diamond drilling machine was placed on the floor in the center of the work chamber.

The wells from the work chamber at the bottom of the shaft were drilled in diametrically opposite pairs, the mouth of each well being one foot above the bottom of the sand. A new development that we call a rod-puller was placed at the mouth of each well during the drilling operation, to run the tools in and out. When 30 to 50 feet of core had been cut in one direction, another core barrel and bit were placed in the mouth of the opposite well and the rear end of the drill rods connected thereto.

So, when a barrel full of core was being pulled from one well, the drill rods and the other set of tools were being run into the opposite well by the same operation. New 10-foot lengths of drill rods were added as the holes were deepened, but the drill rods were not disconnected until both wells were completed. Thereby, drilling time was reduced by 75 percent to 90 percent. The rod-pullers moved the tools out of one hole and into the opposite one at the rate of 100 feet per minute. Three pairs of holes were thus drilled, half of of them to property lines, averaging just under 1000 feet in length.

To the south the oil sand was flat, so the holes in that direction were level. But to the north the bottom of the oil sand was wavy, so the wells in that direction were turned up and down to follow the undulations of the formation. With the special tools used, about 10 minutes was required to turn the hole up or down at any desired angle, without the use of whipstocks. A new type of surveying instrument was developed, integral with the core barrel. With this type of instrument, when a core is pulled a survey of the hole is automatically taken, accurate to 1/16 of an inch per 10 feet.

Casing Program

Each horizontal well is cased with only 100 feet of 3½-inch pipe, grouted in. No other casing or tubing is required in a rock well. A cross on the end of each casing has one end pointed upward to receive vacuum or pressure. The bottom end of the cross of each producing well is connected to the flow line, which is a header leading to the common pump that pumps all liquid to the tanks above ground.

Two wells are drilled at opposite sides of the shaft at one time. A rod puller is shown taking tools out of one hole for removal of core, and for running into opposite hole for more drilling.

Oil and water flow from the wells to this pump by gravity.

As yet, none of the wells from the shaft bottom have been shot. Preparation is being made to shoot wells Nos. 1 and 5 for a length of 800 feet each, with a shot 2½ inches in diameter. Well No. 3, which is between these two, will be shot only for 300 feet (at first) at the far end. A pressure medium of hot gas will be injected into the middle well, under a pressure of 30 pounds per square inch.

Since horizontal wells may be surveyed and controlled at a length of 1000 feet as easily as at 100 feet, there seems to be no reason why holes may not be drilled 3500 feet long. In other words, 800 acres of ground might be worked from one shaft. In drilling the six wells mentioned above there were no fishing jobs.

The drilling of horizontal wells is not difficult, once the technique is understood and the prescribed tools are in hand. However, during the past few months a company specializing in directional and slant vertical drilling has made two attempts to imitate the results herein described .Whipstocks were used to make the required changes of direction. Though 10 whipstocks were employed, at a length of about 1000 feet, each hole missed its objective by some 500 feet and was 20 degrees off the desired direction. Both holes, of course, were abandoned.

Since scores of lives were lost during 1940 in coal mine explosions, due to the exudation of fire-

Oil flows by gravity through casing to bottom of the shaft, from where it is pumped to the surface for lease storage.

damp, which is only natural gas, methane, into the tunnels, it is now proposed to degasify the coal in advance of mining operations. This can be done by drilling horizontal holes out into virgin coal, from present-used mine workings, such holes to be spaced 800 feet apart and drilled 3000 to 5000 feet in length, and each hole to be cased for 400 feet and subjected to a high vacuum. Gas recovery costs will vary from 2 to 5 cents per thousand feet. At the one experiment in removing methane gas from coal in place, in Ohio, there is available through one opening more than 2,000,000 feet of gas daily.

The greatest natural gas reserves in this country are in the coal fields of Pennsylvania, West Virginia and Ohio. Several hundred thousand acres of coal in those states contain from 10,000,000 to 22,000,000 feet of absorbed natural gas per acre. Not only will its recovery be commercially profitable, but the fact that thereby coal may be made practically non-gaseous during future mining operations will greatly reduce ventilating costs, and will remove a serious hazard to miners.

Horizontal Water Wells

In most instances, horizontal water wells are from shallow shafts in unconsolidated material. They are known as water collectors. From near the bottom of a concrete shaft or caisson that has been sunk, 8-inch screen pipes are projected radially through the shaft wall, out into the water-bearing sand or gravel to lengths of 200 to 300 feet. On the forward end of each screen pipe is a digging head that removes the sand and silt from the gravel in the path of the pipe. The quantity of fines so removed may be from four to 10 times the volume of the screen pipe, resulting in creation of clean gravel beds radiating from the central shaft. Each bed may be from six to eight feet in diameter, and in the center of each is the screen pipe leading to the shaft, from which water is pumped.

In some cases, as many as three circles or tiers of radial screen pipes are projected, but always enough perforated pipe so that the velocity of water through the screen openings is less than 2/100 of a foot per second, as compared with a velocity of one to five feet through screen openings of most vertical wells. Water moving into the horizontal screens from the gravel beds at the rate of only ¼-inch per second carried no fine sand and does not promote hardness.

By far the largest well in the world of this type, located at Canton, Ohio. The shaft is 147 feet deep, from which radiate some 30 horizontal screen pipes having an open-hole area of 1,250 square feet. Normal pumpage is about 15,000,000 gallons daily, but its capacity is several times this quantity.

Nine caissons are now being installed in various locations in the East, for industries and municipalities, to have a combined peak capacity of well over 200,000,000 gallons per day. A very large water collector development for a single plant is being installed for a smokeless powder factory at Charlestown, Indiana. There the normal capacity will be 46,000,000 gallons of water daily. Incidentally, this installation is costing the government $1,000,000 less than would have been the cost of filters and an intake from the Ohio River.

The real water problem in many parts of California is to charge into the ground the surplus water of wet seasons, for use during the dry periods.

In many localities horizontal wells may be employed to distribute surplus water into the deeper sand or gravel reservoirs. Most attempts to recharge through vertical wells have failed because of the limited screen area, and the resulting high velocity of water passing into the reservoir bed.

Reverse Water Collector

For recharging, the water collector is reversed, that is, clear water passes down the shaft which penetrates the intervening beds of clay, out into radiating horizontal screen pipes, thence into the sand or gravel beds. Clear water for recharging purposes is best obtained from an upper row of horizontal wells or screen pipes, reaching from near the top of the shaft out into a shallow or surface body of sand or gravel that is saturated during wet periods. Thus, recharging is accomplished by gravity flow.

If the water accumulating in the upper gravels during wet seasons is constantly collected and carried down the shaft, through the clay layers, and into the lower gravel reservoir, then a goodly part of the heavy rains will be utilized to refill the surface gravel beds. Consequently, the loss to the sea by flash floods will be much less than when the upper beds are saturated at the time of the heavy precipitation. In some cases, low diversion dams may be built just downstream from a recharging installation.

In a few favored locations, the overflow from surface reservoirs during wet periods may be utilized for recharging nearby underground sand and gravel beds. As a possible example, during the winter months from three to six billion gallons of water ordinarily flows over the Gibraltar spillway at Santa Barbara, and is lost to the sea. At the same time, nearby Goleta and Carpinteria areas are lowering their water tables below sea level, and are in danger of losing their whole ground water supply through encroachment of salt water. The average quantity of water flowing over the Gibraltar spillway each year is greater than the average annual consumption of both the Goleta and Carpinteria districts.

It will be seen that the development of horizontal drilling has many interesting possibilities. Its novelty may be appreciated by the fact that some 40 patents are being taken out to cover its methods and applications. The greatest present need is for personnel to carry on its development in the various fields that seem to be open.

Inexpensive De-Paraffinator Solves Cold Weather Problem

PARAFFIN troubles during the colder months in Western Kansas, which previously presented a serious problem to one of the larger companies operating in one of the new fields, have been overcome in an inexpensive, simple fashion. Oil lead lines, check valves and gates constantly were becoming clogged or at least partially constricted, causing line pressures to climb to dangerously high points.

At several key points throughout its lease, small hot-oil type "de-paraffinators" of simple but efficient design were set up. Each unit is a portable self-contained unit and in no way interferes with the normal operation of the wells' production once the heaters are put in use.

The shell of the unit consists of a 10-foot length of 20-inch casing, the lower 2 feet of which has been converted into a fire box. The remaining 8 feet is fitted with flue sheets and five 8-foot lengths of 3-inch tubing to make it, in effect, a fire-tube vertical boiler, but with oil instead of water circulating around the tubes. A short stack of light material slips over the top of the boiler and provides the small amount of draft needed. Oil or gas is used for firing, which ever proves to be the more convenient or economical on the particular lease.

The unit is set up at a short but safe distance away from the well selected to take care of that particular area, and is connected up to the well lead line on the one side, and to the surface lines leading to the tanks on the other. Both the input and outlet 2-inch connections, equipped with check valves, are at diametrically opposite points on the boiler shell approximately 2-feet above the fire box. The outlet, or hot oil line, connects with a vertical riser which takes the heated oil from within a foot or so of the top of the column of oil in the boiler.

The normal procedure in operating the heater consists of first heating the oil already in the boiler up to approximately 300° F., after which the well pump is started and circulation is begun. Before the installation of this heater system, tubing and line pressures often attained pressures as high as 300 pounds per square inch. With the circulation of the hot oil, however, paraffin quickly re-dissolves and within less than an hour's time after starting the pump, pressures drop to 75 pounds per square inch or less.

As soon as the initial surge of hot oil has broken through the constricted areas, the oil, now circulating more rapidly through the heater, nevertheless picks up sufficient heat to keep the lines open until the well is shut down. As high as 20 barrels per hour have been pumped through the heater with no apparent indications, even in zero weather, of the lines' starting to accumulate paraffin.

The simplicity and easy portability of this unit makes it particularly desirable, as it can be moved with little trouble to any part of the lease that may be having the most paraffin trouble.

The de-paraffinator unit is set up a short distance from the well, and is connected to the well lead on one side and to the surface lines leading to the tanks on the other.

Wire Ropes Need the Care Of a Machine

A MACHINE has often been defined as a combination of parts so designed that when all are assembled as a unit they shall work together to produce a specific result.

Certainly, that definition applies to every wire rope made. For example, a rotary drilling line is a wire rope usually designated as 6 x 19 Seale, improved plow steel with hemp center. That means it is composed of six strands. Each strand contains 19 wires of two different sizes, and all strands are laid around a hemp center or core. In other words, the machine best suited for rotary drilling hoisting contains 114 parts made of a grade of steel called "improved plow," and a vegetable part called a core. Possibly the core has 3 parts—maybe 5.

So in one rotary drilling line there are either 115, 117 or 119 parts. And the dimensions of those parts may be entirely different for ⅞-inch, 1-inch, 1⅛-inch, 1¼-inch and 1⅜-inch diameter lines.

And there are different wire lines —machines, if you please—of different design and of parts of varying dimensions and materials for bailing, cable-tool drilling, swabbing, coring, pulling or running rod and tubing with bull wheel equipment, rod and tubing jobs with a pulling unit, winch truck use, etc.

While rugged in make-up, this machine is delicate. Its ultimate in performance will depend entirely on its treatment during installation and thoroughout its period of service.

Greater Burdens on Equipment

It cannot be forgotten that the demands of modern oil-well drilling have necessitated increased burdens on all forms and equipment, while at the same time calling for maintenance of exacting qualities. Resultantly, the size of machinery has, as a general rule, been increased greatly. Controversely, wire rope has had to keep within certain specified size limitations while at the same time assuming capabilities of strength and stamina to cope with the demands of larger and more powerful industrial giants.

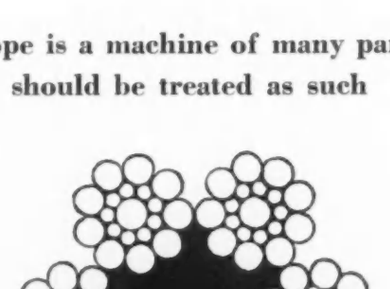
Consequently, wire rope has had to fulfill the double requirement of providing increased qualities without being enlarged. Wire rope is, therefore, a product of research to a greater degree than perhaps any other industrial machine. Few, even those who handle wire rope, realize its importance to our daily lives. Because of that importance, research has been necessary to keep it up to the standards its usefulness demands.

In its laboratory stages, wire rope passes through such general physical testing as metallurgy and metallography. Service conditions are exhaustively studied and better ways of meeting them are evolved.

Manufacturers carefully test thier wire rope for its tensile strength, elongation and torsion, and manufacture their products to extremely close tolerances. Wire rope comes to its user in as near perfect condition as can be achieved, but frequently all the attention it has received at the mill goes for naught because of carelessness in the field. Just as only a diamond will cut a diamond, so are wire rope economies dictated by the rope itself.

In the oil country, wire rope performs specific tasks dictated by the nature of the industry. Heavy duty equipment for the drilling of deeper wells, particularly for the rotary drills now commonly used, require high quality rope designed and fabricated for this special purpose.

Wire rope is a machine of many parts and should be treated as such



The usual wire line used in the oil field for rotary drilling has more than 100 parts. The above sketch of a 6 x 19 Seale construction wire rope means that it is composed of 6 strands, and each strand containing 19 wires of two different sizes. The strands are laid around a hemp center or core. While rugged in make-up, this machine has many small delicate parts and its performance will depend upon the treatment it receives in the oil field.

RIGHT LAY REGULAR LAY

LEFT LAY REGULAR LAY

RIGHT LAY LANG'S LAY

The direction of a rope's lay may be determined by studying the above sketches. In Lang's lay rope the wires in the strands and the strands are laid in the same direction, which is opposed to the direction of regular lay rope.

The rope oil operators use, since the industry's inception to its present highly developed state of efficiency, has been created for this particular service. Each phase of oil-well drilling has been studied and analyzed through field surveys and tests, as well as laboratory research. Yet, rope care and maintenance, that the greatest economy and longevity will result, must of necessity break down into definite formulas common to all heavy-duty rope uses. This fact makes it difficult to give emphirical rope service data. The very nature of the machine itself necessitates conformance to rules and regulations each manufacturer establishes for his particular product.

API Standards

The American Petroleum Institute, through its Division of Production, has performed a most admirable and excellent job of formulating sound rules for field care of wire rope. This work is known as API Standards No. 9-A, published in April, 1940. Approximately 15 pages in this handy pocket size booklet are devoted to recommended practices for the field care and use of wire rope, including suggested improvements in the design of auxiliary equipment that will lengthen the life of wire rope. Every drilling contractor would find it profitable to furnish each of his men with personal copies of this inexpensive pamphlet.

To the experienced user, it may sound trite to say that wire rope is a costly machine and should be treated as such. A reel of rope should no more be dropped from cars or trucks or moved by prying against the coiled rope, than one would drop his watch or poke the main spring to make it tick. When not placed in service immediately, it should be placed in a dry place free from acid fumes and high temperatures. To be even more elementary, perhaps to the consternation of our readers, kinking must be avoided in unwinding. Wire rope cannot be uncoiled like a hemp rope. In the majority of instances, shortened rope life can be traced directly to failure at a specific point as a result of a kink. Kinking distorts the relation of the strands and wires making up the strands, thus causing unequal stresses in the strands at that point and permanently damaging the structure of the metal itself. You would not disturb the relationship of the works within your watch, therefore have the same regard for your wire rope. Too, in preparation for an idle period, ropes must be lubricated thoroughly with a lubricant that will keep out moisture. It is advisable that this be done as the rope is being rewound on the drum.

Keep Clean and Moisture Free

Wire rope should never be permitted to stand in mud or dirt; temporary planking or cribbing will pay dividends against such carelessness. If wire rope becomes covered with dirt or grit, clean it with a brush. Do not use a solvent —remember wire rope has been lubricated by the manufacturer with the same care automobile manufacturers take to see that every moving part is provided with lubrication facilities.

In the manufacture, great care is taken to establish a definite relationship between component wire parts in order best to meet operating conditions. Therefore, equal care must be taken during installation to make certain that these relationships are not disturbed. This requires neither an expenditure of time or money; merely observance of rules with which every rope user should become familiar. Yet many neglect these simple rules through carelessness born of familiarity. It is forgotten that a new rope reel should be mounted on a substantial cribbing, with a brake applied to either or both flanges. As many know, a simple yet effective brake consists of a piece of timber slightly grooved to fit the flange of the reel, with one end pivoted on the cribbing so that it bears against the top of the flange. How many of us have not seen rope unwound by whatever convenient method best suited the occasion? In practically every oil field it is possible to observe rope treated like the stepchild it decidedly is not. Wire rope is a working wage-earning member of the family and should be treated with respect, or it will go haywire some day and do more than slap us in the face when it breaks.

Bending and unbending will eventually wear out the best of ropes, however thorough their care may have been. To be sure, the better the rope and its care the longer it will stand up, but fatigue will eventually cause broken wires on the crown surface. Life may be prolonged by distributing the sections subjected to continued bending by the simple process of cutting off a piece of the rope, thus causing a different portion of the rope to undergo the extreme bending. A rope naturally will live as long as it requires to wear out the entire

rope, and need not be discarded prematurely due to the dangerous condition of one small section.

When cutting off a piece of standard or non-preformed rope, seizing must not be neglected. Inadequately or loosely bound ends naturally result in distortion of the rope, due to the internal stress present in non-preformed or standard ropes. A rope so distorted, when later attached and put under tension, bears its load unequally by the several strands within the rope. For a rope to do its share of work, each of its parts must bear an equal part of the load. Rather than go into the different methods of seizing in an article of this length, users are referred to manufacturers' suggestions applying to the specific types of rope.

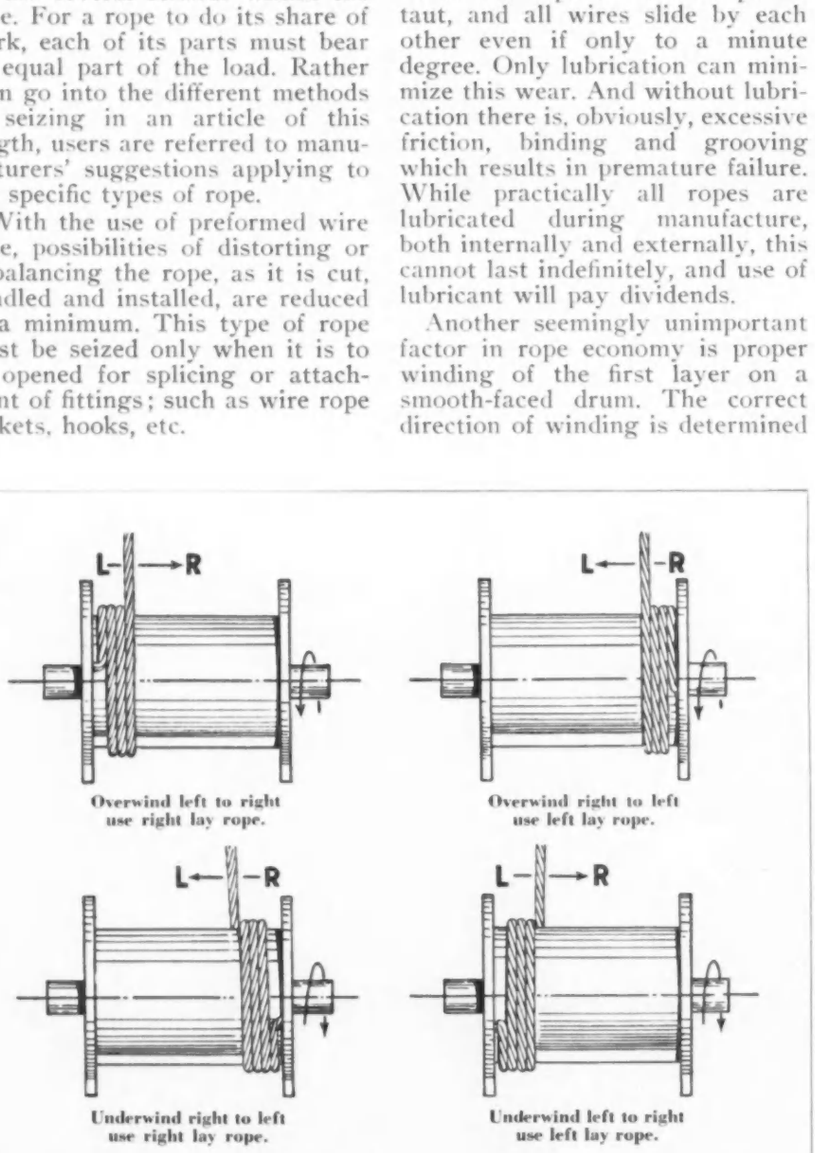
With the use of preformed wire rope, possibilities of distorting or unbalancing the rope, as it is cut, handled and installed, are reduced to a minimum. This type of rope must be seized only when it is to be opened for splicing or attachment of fittings; such as wire rope sockets, hooks, etc.

Much stress is given by many authorities to external abrasions, yet the internal parts of a rope are of equal importance. Just as "Junior" can afford to use a little soap behind his ears, so can the rope user afford to use a little lubrication between the strands. The internal parts of a rope constantly move one against the other whenever the rope passes over a sheave or winds on a drum. Each strand slides past its neighbor when the rope is bent or pulled taut, and all wires slide by each other even if only to a minute degree. Only lubrication can minimize this wear. And without lubrication there is, obviously, excessive friction, binding and grooving which results in premature failure. While practically all ropes are lubricated during manufacture, both internally and externally, this cannot last indefinitely, and use of lubricant will pay dividends.

Another seemingly unimportant factor in rope economy is proper winding of the first layer on a smooth-faced drum. The correct direction of winding is determined by standing at the rear of the drum and facing the direction of rope travel. If the rope overwinds on the drum, right-lay rope should be started from the left flange. Left-lay rope should be started from the right flange. If the rope underwinds to the drum, these rules are reversed. The advantage in applying rope in proper direction of its lay is that when the load is slacked off, the several coils on the drum will hug together and maintain an even layer. When improperly applied, the coils will spread apart at each removal of load and when winding is resumed, the rope may criss-cross and overlap on the drum with flattening and crushing of the rope as a result, and consequently early destruction will be the natural outcome.

Overloading develops severe tensile and fatigue stresses within the wires of a rope and results in premature failure. When a load is applied to a rope, each strand within a six-strand rope theoretically assumes one sixth of the applied load. This strand load, or tension, translates itself into a compressive load on the core. Overloading fatigues the wires within the rope and results in premature failure. To combat this, a tension meter will tell rope truths, some of which may be unpleasant, but nevertheless profitable. The safety factor of operation of wire rope is the ratio between the rated breaking strength and load applied. Applied loads must be computed by taking into consideration increased loads due to starting and stopping and frctional resistance. Since frictional resistance is indeterminate, use of the tension meter will tell the applied rope load. If abnormally high loading is likely to occur, the safest and most economical rules recommend the use of stronger lines, higher grades or larger rope size, or to change the reeving so that more parts of the line support the load.

A rope's comparative life is almost directly proportionate to the factor of safety under which it operates.



Overwind left to right use right lay rope.

Overwind right to left use left lay rope.

Underwind right to left use right lay rope.

Underwind left to right use left lay rope.

All wire ropes should be spooled correctly onto drums. Unless the rope is applied in the proper direction of its lay, the coils on the drum will not hug together and maintain an even layer. With rope of improper lay the coils will spread apart at each removal of load and when winding is resumed the rope may criss-cross and overlap on the drum with flattening and crushing of the rope as a result.

The proper direction of rope lay is determined by standing behind the drum and looking toward the direction of rope travel. The proper direction of rope lay to give best results is then shown in the above sketches.

One-Fifth Working Load

The American Petroleum Institute recommends that for general purposes, particularly running ropes, the working load of a wire rope should not exceed one-fifth of the breaking strength. This means

that the factor of safety should be not less than five. To determine proper working load, divide the breaking strength by the proper factor of safety; for example, a ⅞-inch diameter 6x19 plow steel rope has a breaking strength of 28 tons, and with a factor of safety of 5, the proper working load would be 5.6 tons. Factors of safety in excess of 5, varying up to eight and even more, are often required for safe and economical operation.

Worn, pinching sheave grooves and increased speed are other factors having great affect on rope life. Sheaves should be as large as possible. The bending stress in a wire rope is that stress which is produced when the rope is bent around a sheave or drum. Therefore, the larger the diameter of the sheave, the longer the rope will last. If the grooves or sheaves are worn, rough edges are likely to cut the rope wires. In all cases, the sheaves should be smooth and of a slightly larger radius than the rope. Experience has proved that fatigue and wear increase with speed. Rope life will vary approximately inversely to the square of the speed. Economy will result from increasing the load, if kept within the safe limits, and diminishing the speed.

There are no definite rules that can be given which will enable the inexperienced person to determine when a worn rope should be discarded and replaced. The service for which the rope is used, and the possible consequences if it should break, are important considerations in such determinations. The most important forms of rope deterioration that should be watched are:

1. Number and location of broken wires.

2. Extent of reduction of wire diameter from wear.

3. Corrosion.

4. Local reduction in rope diameter.

5. Local elongation of rope lay.

Proper selection of the correct rope for the particular job is essential. The design of each type of rope is planned to resist a certain type of destruction. The usual result is, however, loss of resistance to another type of destruction. For example, few but large-diameter wires in the strands provide a rope that withstands abrasion for a long period, but fails from bending more quickly. The rope made of small diameter wires better resists bending, but will fail more quickly as a result of abrasion. The longest rope service will result from a compromise between resistance characteristics to meet the destructive forms as they are present in the particular rope use. If in doubt as to the type of rope that should be used, it is wise to consult with the engineers of some wire-rope manufacturer. The use of preformed wire rope for operating lines, those subject to bending over sheaves and drums under loads, will permit selection of rope constructions that offer economical rope performance. Preforming increases the bending life of wire ropes, and therefore permits the selection of constructions that offer the highest resistance to abrasive wear and crushing.

Abrasion resistance is directly proportionate to the size of the outer wires in each strand. The larger the outer wires, the more resistance the rope will have to wear, while the smaller the outer wires, the less resistant the rope will be to wear. For bailing sand lines on oil-well rigs, for example, a rope of 6x7 construction should be used in order to assure the correct amount of abrasional resistance.

Size Relation to Economy

The size of a rope should not be confused with economy when making rope purchases. While it is natural that a smaller rope costs less, unless the rope selected is adequate in strength, it becomes costly in the end because of its shorter service life and consequential usage of additional feet. Ropes for any purpose should be selected under engineering guidance. It is for this reason that manufacturers maintain engineering staffs of specialists in practically every rope use.

Continued tension and release from tension results in ultimate deterioration, due both to the molecular or grain structure within the steel and the gradual breaking down of the hemp center as a result of the cutting of the fibres within the core. This latter condition also is caused by gradual elimination of lubrication which maintains fibre pliability. Material disarrangement will not take place unless the rope is loaded to a point equal to or larger than the fatigue limit of the material within the steel wires, which is about two-thirds its elastic limit or roughly 44 percent of its ultimate strength. When loaded below the elastic limit, no permanent injury will result. When loaded above the elastic limit, the wires will stretch and stay stretched permanently. Between the range of overloading and underloading lies a condition of economical loading. Economical loading ranges have been established in the form of safety-factor values.

Preformed rope is, of course, the ultimate for the majority of uses. In the fabrication of a preformed wire rope, each wire and each strand is preshaped to the form it will assume in the finished rope. This process removes the internal stress, which is evident in standard wire ropes by their tendency to immediately fly apart upon removal of seizing bands. Since this integral stress is removed from the preformed wire ropes they are found to have longer bending life, may be cut without the use of seizing, and the eventual broken wires lie in their normal position where they are unable to injure adjacent wires, sheaves and drums, or workmen handling the ropes. The perfect balance of the preformed ropes assures equal distribution of the load over all its component parts, and the fullest advantages from the use of an independent wire rope center. It is for this and other reasons that in rotary drilling close to 60 percent more preformed rope has been sold to oil-well users than non-preformed, and that these users, on an average, have received some 41 percent increased performance from preformed.

Empirically speaking, there is wire rope knowledge to be gleaned by the men in the field actually handling its operation, and by engineers studying the reports of field users and compiling statistical data from the records of many users. But because practical experience knowledge varies so greatly with each job, each operation, and each method of handling, it has been found more successful to rely on manufacturers' service records and statistics for guidance in applying the correct rope for the particular job and for gaining the utmost in service with the greatest economy.

Wire roping is, after all, as has been said, wire engineering, and therefore must be considered scientifically.

Stratigraphic Traps Source of Major Production Over Central Kansas Uplift

By JOSEPH A. KORNFELD, Geologist

Part 2

IMPORTANT accumulations of oil and gas have been developed from stratigraphic reservoirs on and flanking the Central Kansas Uplift. As pointed out in Part 1 of this series [THE OIL WEEKLY, January 13, 1941, page 13], the geographical scope of these producing areas takes in 17 counties.

The vertical geologic range covers the pre-Cambrian, the Cambrian, Cambro-Ordovician, silurian, Mississippian and Pennsylvanian. In the past, stratigraphic traps in Western Kansas have been discovered largely accidentally, rather than as the object of specific exploration. Today, a new technique is being developed in the search for this type of trap, including wedges, off-shore bars, regional terraces, porosity changes, and flank, truncated zones.

The present chapter will discuss the production characteristics, geology, lithology and crude-oil analysis data of each formation productive from stratigraphic traps on the Central Kansas Uplift in the following order:

Geologic System	Formation
Archean	Quartzite Fracture Zones
Pre-Cambrian	Granite Wash
Cambrian	Reagan sand
Cambro-Ordovician	Arbuckle dolomite
Ordovician	Simpson sands and dolomite
Ordovician	Viola limestone
Silurian	Hunton limestone
Lower Mississippian (?)	Misener sands and dolomites
Mississippian	Mississippi Chat
Various geological ages	Sooy Conglomerate
Pennsylvanian	Marmaton

Hydrocarbons in Pre-Cambrian

Occurrence of commercial quantities of crude oil from several pools on the Central Kansas uplift from Archean quartzite represents the oldest known oil accumulation throughout the world.

Age of the quartzite producing oil from fracture zones is Archean. No Lower Cambrian rocks were deposited over the uplift. The quartzite and schists unconformably overlies intrusive granitic batholiths of Archean age.

The Pre-Cambrian history of the Central Kansas Uplift is complex and is discussed in part elsewhere in this article. Sample studies on a broader scale and deeper well penetrations of the Pre-Cambrian are needed to shed new light on the structure of the basement rocks.

Hydrocarbons and carbonaceous material are known in both the Proterozoic and Archean systems. Graphite occurs in the Ontario district of Canada in rocks of the Sudburian group of the Proterozoic, representing metamorphism of carbonaceous materials.

Clarke[13] cites the pioneer work of W. A. Tilden in 1896 on laboratory analysis of red Peterhead granite; this rock gave off 2.61 times its volume of gases, containing 24.8 percent of CO_2 and 75.2 percent of hydrogen. Clarke also points out the work of A. Gautier on the quantitative determination of hydrocarbons in granite, heated in vacuo at 100 degrees; one sample yielded 12.3 cubic centimeters of hydrocarbons per kilogram of rock, while another sample gave off 5.3 cubic centimeters per kilogram.[14]

Pre-Cambrian Quartzite

An unusual accumulation on the Central Kansas Uplift is the occurrence of oil unweathered, Pre-Cambrian crevice zones, although on the crests of local eroded knobs occupying the highest structural levels of the uplift. These examples are noted in three separate pools beneath the highest structural contours; at Orth and Orth East pools in Rice County and in the Hall-Miller pool of Russell County.

In all these pools, the Pre-Cambrian quartzite is unconformably and disconformably overlain by Lower Pennsylvanian rocks ranging from the (Bronson group to the Kansas City group of the Missouri series). Arbuckle dolomite of Ordovician age and Cambrian sand of Cambrian age is encountered on the flanks of these structures (exception, no Cambrian sand pay reported at Orth or Orth East). The interval from the top of the unweathered Pre-Cambrian quartzite to the top of the producing quartzite zone varies widely, which suggests that the crevices lie at steep angles forming stratigraphic traps on the flanks of these eroded Pre-Cambrian peaks. This interval variation is shown in Table 5.

Orth Pool. The first pool discovery from the Pre-Cambrian quartzite was the Orth pool in northwestern Rice County, situated 3½ miles south of Bushton. Basis of discovery was the core drill. The discovery well was Slick, Pryor & Lockhart's Orth 1, SE SE NE 27-18-10w. It was

TABLE 3
Central Kansas Uplift Stratigraphic Producing Reservoirs by Formations

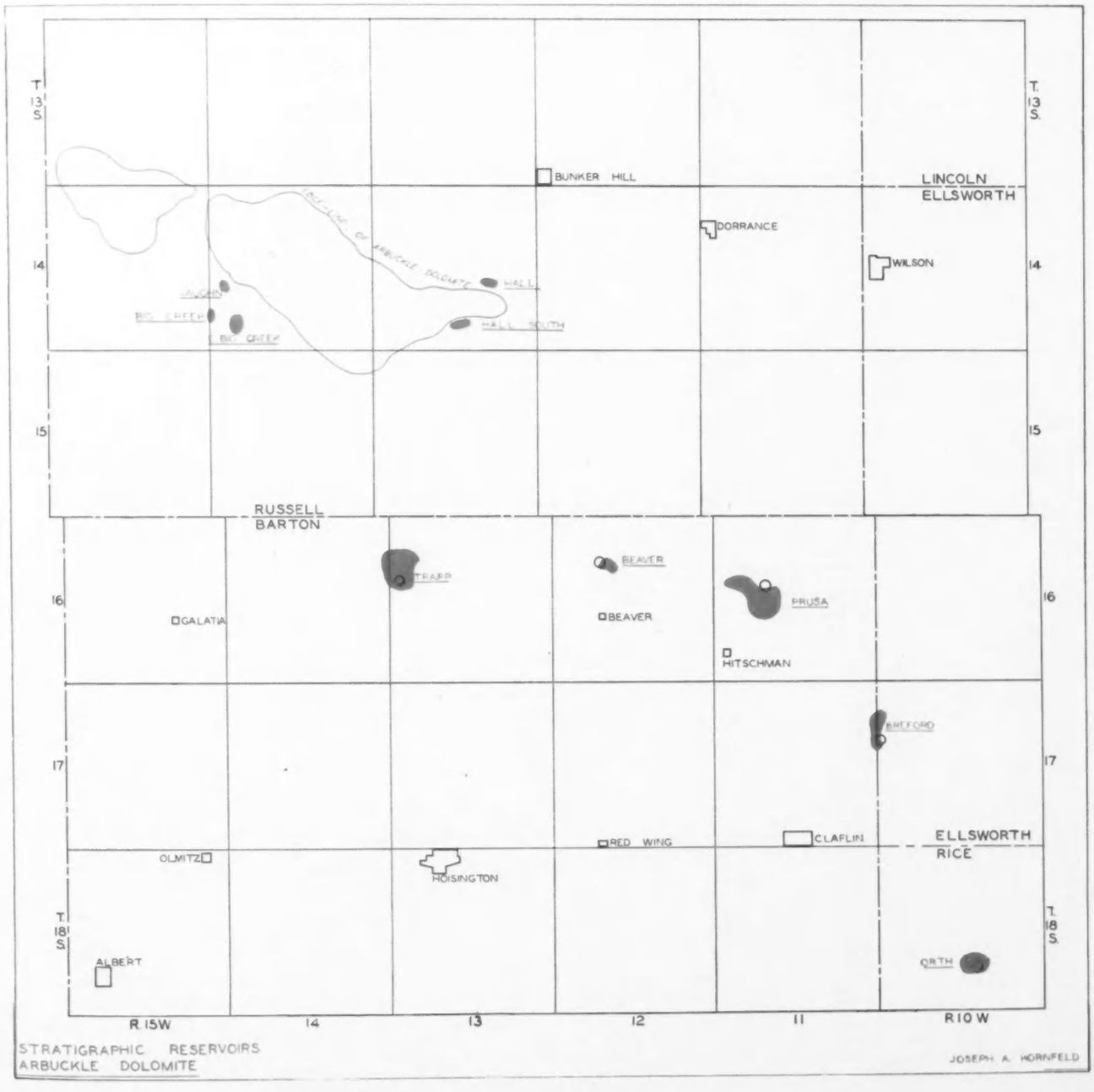
FORMATION	PRODUCING POOLS			Depth Ranges	Gravity Ranges
	Oil	Gas	Total		
Marmaton Formation	1	..	1	3746–3960	34–42
Sooy Conglomerate	21	1	22	3130–4535	23–47
Mississippian Chat	7	..	7	3150–4440	32–40
Kinderhook-Misener	8	1	9	3258–3339	39–41
Hunton Lime	5	..	5	3274–3500	35–41
Viola Limestone	1	..	1	3700–3800	40
Simpson Formation	9	1	10	3274–4297	38–48
Arbuckle Dolomite	13	..	13	3171–3820	35–43
Cambrian Sand	10	..	10	3040–3655	33–39
Granite Wash	1	..	1	3180	.....
Pre-Cambrian Quartzite	3	..	3	3141	40–43
Eleven Formations	80	3	83	3040–4535	23–48

[13] Clarke, Frank W., "Data of Geochemistry," Bulletin No. 695, U.S.G.S., page 269.
[14] *Ibid*, page 271.

completed on July 9, 1932, for an initial production of 1800 barrels of 40 (Baume) gravity oil per day, from crevice zone drilled from 3240 to 3243 feet, total depth. To January 1, 1940, 14 oil wells were brought into production from the Pre-Cambrian quartzite from an average pay thickness of only 3 feet; of this total, 3 flank wells were later abandoned. Cumulative production as of that date was 580,762 barrels of oil, representing an average of 41,483 barrels of oil per well. Productive relief as measured on top of the Pre-Cambrian quartzite exceeds 97 feet, in only 5/8-mile. The pool lies on the crest of an eroded Pre-Cambrian peak, the axis of which trends from east to west. Three gas wells have been completed from the Lansing-Kansas City lime series of Lower Pennsylvanian age topped at 2850 feet. Porous zones were found from 2906 to 2936 feet. Initial volumes range from 13,000,000 to 17,000,000 cubic feet daily.

Orth East Pool. One mile east of the Orth pool, another quartzite oil pool was discovered in October, 1939. The first well was Fred Jones and Walter Swain's Behnke 1, CW½ SW NW 25-18s-10w. Like the Orth pool proper, this discovery was the result of core-drill exploration. Similarly, commercial gas was indicated from the Lansing-Kansas City lime series topped at 2863 feet, but the drill passed from Lower Pennsylvanian rocks directly into Sooy conglomerate of the Basal Pennsylvanian, thence into Pre-Cambian quartzite topped at 3198 feet. Six feet below the top of the quartzite, oil pay was encountered in a 5-foot zone from 3204 to 3209 feet, although the well was completed at 3214 feet in the Pre-Cambrian. Gravity tested 43 degrees A.P.I. The north offset found production from the Arbuckle dolomite, while the west offset encountered its oil pay in the Pre-Cambrian 51 feet structurally higher than the discovery.

Hall-Miller Pool. Twenty-seven miles northwest of the Orth pool, another Pre-Cambrian quartzite pool was discovered over a truncated Pre-



Cambrian peak. The pool find was Skelly Oil Company's Opdycke 3, SW SW NW 29-14s-13w, in southern Russell County. This well topped the Lansing-Kansas City lime series at 2873 feet, encountered neither Arbuckle dolomite nor Reagan sandstone, entering the Pre-Cambrian quartzite at 3141 feet or at a subsea datum of 1400 feet. Oil pay was topped at 3154½ feet or a datum of 1413½ feet; 25 feet of pay section was logged to 3179½ feet, or datum of 1438½ feet. Initial production was 429 barrels of oil per day. Cumulative production was 5985 barrels.

Niedenthal Area. Ten miles northwest of the Hall-Miller Pre-Cambrian discovery, oil in noncommercial quantities was encountered in a deep test drilled during October of 1935 in the Niedenthal area. Phillips Petroleum Company's Amelia 1, SE SW SW 6-14s-14w, topped Lansing series at 3050 feet (datum 1166 feet) and Pre-Cambrian quartzite was topped at 3305 feet (datum 1421 feet). Six feet below the top of the Pre-Cambrian rocks, a 1-foot oil stratum was logged in a crevice from 3311 feet (datum 1427 feet). However, operators drilled the well into water, since at 3315 feet (datum 1431 feet) the well tested 700 feet of oil and 400 feet of water; plugging back from 3316 feet, the total depth to 3313 feet, yielded all water. The well pumped 1 barrel of oil and 4 barrels of water per hour, for a time.

From a geologic standpoint, it is interesting to note that the accumulations in the Pre-Cambrian occur along the highest structural contours of the uplift proper as reflected in the narrow convergence intervals between the top of the Lansing-Kansas City lime series and the top of the Pre-Cambrian as shown in Table 6. Likewise, the single accumulation of oil in the granite wash lying near the crest of one of these Pre-Cambrian peaks as will be described later.

TABLE 4
Central Kansas Uplift Stratigraphic Producing Fields by Formations

POOL	County	DISCOVERY WELL DATA			No. Wells	Gravity Range
		Location	Date	Depth		
Pre-Cambrian:						
Hall	Russell	29-14-13w	.....	3141	1	....
Orth	Rice	27-18-10w	7- 9-32	3240	14	40
Orth East	Rice	25-18-10w	10-20-39	3198	3	43
Cambrian Sand:						
Sullivan	Russell	2-14-15w	2-19-36	3310	133	39
Otis	Barton-Rush	18-15w	8-23-34	3527	17	33
Beaver	Barton	16-16-12w	12-17-34	3348	..	39
Foster	Russell	3-14-15w	3-11-36	3040	..	36
Gorham	Russell	33-13-15w	1-29-28	3299	..	34
Hall	Russell	35-14-14w	9-17-36	3165	26	..
Harbaugh	Russell	25-14-15w	6- 5-36	3152	..	..
Ray	Phillips	32-5s-20w	40	....	3	35
Prusa	Barton	20-16-11w	5-10-39	3304	..	..
Penny-Wann	Ellis	13-15-20w	10- 1-36	3655	1	..
Arbuckle:						
Beaver	Barton	16-16s-12w	.....	3348	..	39
Prusa	Barton	16s-11w	.....	....	..	..
Orth E.	Rice	25-18s-10w	.....	....	..	..
Big Creek	Russell	36-14s-15w	7-17-35	3171	..	37
Big Creek E.	Russell	31-14s-14w	.....	....	..	..
Vaughn	Russell	19-14w-14w	.....	....	..	..
Dumler	Russell	1-14s-15w	.....	3303	..	..
Greenwalt*	Rush	17-19-16w	9- 2-31	3820	..	..
Milberger	Russell	7-14-14w	5- 1-35	3305	..	35
Niedenthal	Russell	23-14-15w	9- 5-34	3247	..	40
Peterson	Russell	12-14-15w	10- 2-36	3292	..	..
Sullivan	Russell	2-14-15w	10- 9-35	3321	..	..
Prusa West	Barton	18-16-11w	9- -39	3828	..	43
Lyons	Rice	14-20- 8w	12- 4-30	3274	1	39
Blue Hill	Ellis	11-12-16w	8- -38	3358	..	42
Geneseo*	Rice	36-18- 8w	4-29-36	3154	..	..
Iuka	Pratt	11-27-13w	10- -37	4297	..	38
Anness	Sumner	2-30- 4w	.....	4394	1	..
Schulte*	Sedgwick	6-28- 1w	11- -38	3666	..	44
Curry*	Sedgwick	2-27- 1w	10-27-29	3389	1	41
Rickard	Rice	22-18- 9w	9-25-36	3254	..	..
Snider S.	Stafford	16-21-11w	.....	....	..	..
Seneca*	Sedgwick	18-28- 1e	.....	3490	1	..
Hunton:						
Sperling	Harvey	23-22s- 2w	12- -34	3300	7	35
Hollow-Nikkel	Harvey	20-22s- 3w	12-17-33	3500	..	43
Hesston	Harvey	8-22s- 1w	9-24-34	3313	1	39
Graber	McPherson	32-21s- 1w	5-26-34	3274	125	41
Burrton	Harvey-Reno	-23s- 4w	3-28-34	3585	77	42
Misener:						
Zenith	Stafford	23-24s-11w	9- 2-37	3800	150	40
Graber	McPherson	17-21- 1w	5- -37	3325	..	41
Eastborough	Sedgwick	-27- 2e	.....	....	..	..
Goodrich	Sedgwick	17-25- 1e	.....	3339	..	..
Wellman	Rice	22-21- 9w	10-28-37	3316	4	..
Hesston	Harvey	7-22- 1w	11- -38	3285	1	39
Voshell	McPherson	9-21- 3w	.....	3410	..	40
Valley Center	Sedgwick	7-26- 1e	3-30-29	3368	..	..
Medicine Lodge	Barber	15-33-13w	3- -37	4900	2	..
Mississippian:						
Barnholdt	Rice-McPherson	30-20- 5w	8-10-37	3360	128	39
Welch	Rice	35-20- 6w	1-28-34	3370	28	34
Welch N.	Rice	23-20- 6w	6-22-37	3354	3	..
Voshell	McPherson	10-21- 3w	29	3150	..	40-43
Medicine	Lodge Barber	13-33-13w	1-13-27	4440	..	..
Ponce*	Rice	28-21- 7w	6-10-36	3388	1	36
Neola*	Stafford	15-25-11w	3-26-34	3920	1	40
Sooy Conglomerate:						
Sellens	Russell	36-15-13w	6-20-29	3348	..	..
Driscoll	Russell	30-15-11w	9-10-40	....	..	..
Bloomer-Cong.	Ellsworth	19-17-10w	9- -30	3281	1	44
Wherry	Rice	16-21- 7w	3-30-36	3362	..	32
Wherry East	Rice	12-21- 7w	8-30-37	3461	..	38
Sterling	Rice	4-22- 8w	2- 3-38	3367	1	..
Rickard	Rice	22-18- 9w	35	....	..	47
Raymond-Cong.	Rice	21-20-10w	7-29-29	3278	1	..
Hadley	Ellis	20-11-17w	.....	3428	1	29
McCarty*	Edwards	31-25-17w	5-22-29	4535	..	35
Webster*	Rooks	21-8s-19w	12-21-32	3442	..	23
Sullivan	Russell	2-14-15w	2-19-36	3310	..	39
Hall	Russell	30-14-13w	1-11-35	3451	..	40
Hall North	Russell	20-14-13w	10-23-37	3170	..	..
Fairport	Russell	8-12-15w	8- 5-28	3211	..	..
Gideon	Russell	8-15-14w	6- 8-30	3266	1	..
Bison	Rush	27-17-17w	11-21-28	3573	1	..
Kraus	Ellis	22-14-19w	9-19-36	3735	2	35
Trapp-Cong.	Russell	36-15-14w	7- -37	....	..	39
Krier	Barton	30-16-11w	11- -39	3130	2	42.5
Feltes	Barton	14-16-12w	39	3342	1	..

* Abandoned producing area.

Granite Wash

The occurrence of commercial quantities of oil from the granite wash is known by the writer in only one locality on the Central Kansas uplift—the Gurney sector, now combined with the Hall pool of Russell County. Accumulations from granite wash are common in the Texas Panhandle on the flanks of the Amarillo uplift where it is overlain by Permian limestones, and dolomites. This occurrence is truly an unconformity accumulation encountered in talus slopes.

Hall Pool. The discovery well of the Hall granish wash pool occupies the second highest subsea position of the Pre-Cambian of any well in southern Russell County. The top of the reworked Pre-Cambrian is encountered at 3180 feet (minus 1294 feet). From a regional consideration, it is exceeded in subsea elevation on the Pre-Cambrian, only 108 feet by a well in Section 30-16s-11w, in the Krier pool, 18 miles southeast. It is 103 feet structurally higher than the highest well in the Orth Pre-Cambrian pool, producing from the Pre-Cambrian quartzite. The Hall deep discovery lies well within the truncated area from which the Arbuckle dolomite is eroded.

The greatest geologic time break on

the Central Kansas Uplift is represented in the Hall pool. Here the old Pre-Cambrian land surface with its truncated granite core is overlain unconformably and disconformably by rocks of the Bronson group of the Missouri series (Lower Pennsylvanian in age).

The discovery oil well of the Hall deep pool was Empire Oil & Refining Company's Ebel 1, SWc 24-14s-14w. Lansing-Kansas City lime series was topped at 2932 feet (1046 feet subsea). Lansing oil pay was found from 3013 to 3016 feet and from 3136 to 3140 feet; the unconformity was reached at 3180 feet (1294 feet subsea), where the grante wash was

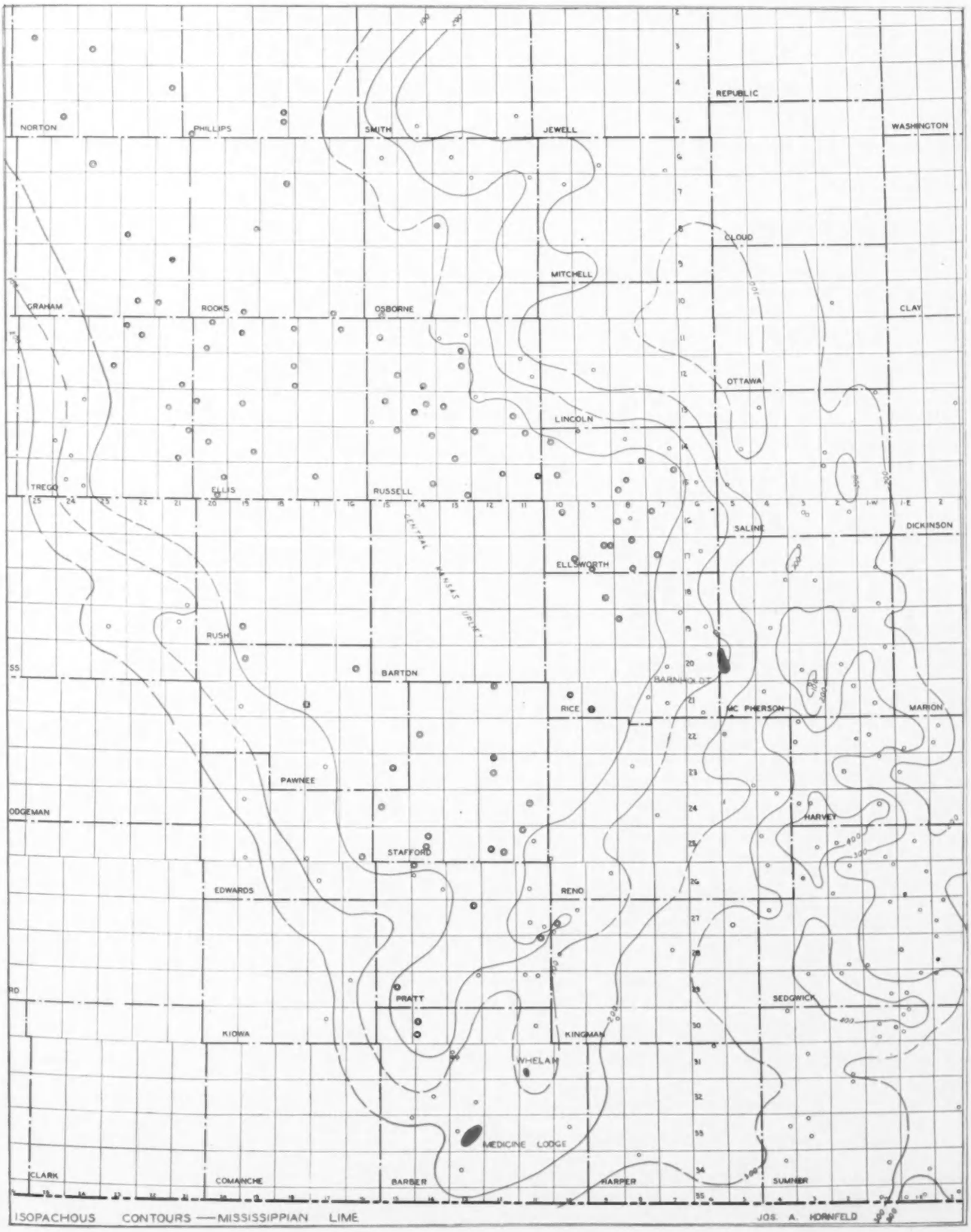


TABLE 5

POOL AND COUNTY	Top Pre-Cambrian	Top Pre-Cambrian Oil Pay Zone	Interval in Feet
Orth, Rice	3,161 (−1,409)*	3,195 (−1,443)	34
Orth East, Rice	3,198 (−1,457)†	3,204 (−1,463)	6
Hall-Miller, Russell	3,141 (−1,400)‡	3,154 (−1,413½)	13½
Niedenthal, Russell (Non-Commercial)	3,305 (−1,421)§	3,311 (−1,423)	2
Summary	−1,400 to 1,421	−1,423 to −1,443	2 to 38½

* Skelly Oil Company's 1 Volkland, SE SE NW 27-18s-10w.
† Fred Jones and Walter Swain's No. 1 Behnke, C W½ SW NW 25-18s-10w.
‡ Skelly Oil Company's No. 3 Opdycke, SW SW NW 29-14s-13w.
§ Phillips Petroleum Company's 1 Amelia, SE SW SW 6-14s-14w, pay 3,311-3,312 feet, water from 3,312 to 3,314 feet; oilfillup 700 feet, with 400 feet of water at 3,315 feet; at 3,313 feet hole full of water was encountered in the pre-Cambrian rocks.

found. Granite wash proved to be 85 feet thick and the top of the granite was encountered at 3265 feet (1379 feet subsea). Granite was penetrated 20 feet to 3285 feet (1399 feet datum) total depth. It swabbed 90 barrels of oil in 6 hours. The diagonal southeast offset was completed in the same formation at Stanolind Oil & Gas Company's Ben Rein 2, SE NW NW 25-14s-14w.

Cambrian Sand

The "basal" sand of Upper Cambrian age produces oil and gas at widely-scattered sectors of the Central Kansas uplift. These occur principally as local truncations off the flanks of eroded, Pre-Cambrian knobs. Largest of these knobs is the Otis structure.

Otis Pool. Structure of the Otis pool is that of a northwest-southeast Pre-Cambrian fold extending from western Barton County across Rush County and terminating in southwestern Ellis County. The Arbuckle dolomite and the basal sand are truncated over the crest of this old land surface. On the southeast flank of this old prominence is found the Otis gas field; oil is produced from a lens in the Upper Cambrian on the south flank of the structure, yielding 33-gravity oil. Further southward, the Arbuckle dolomite produces oil in the Greenwalt area (abandoned) from a stratigraphic position. On the northeast flank of this broad geologic feature the Penny-Wann (Cambrian) discovery well was discovered in southwestern Ellis County.

Russell District. Flanking a truncated major buried prominence in the Pre-Cambrian in southern Russell County are the following pools yielding oil from the Cambrian sand: Sullivan, Foster, Gorham, Hall, and Harbaugh.

On a southeastward extension of this trend into northeastern Barton County are encountered the Beaver-Cambrian pool and the Prusa-Cambrian pool.

Ray Pool. On the northwestern extension of the Central Kansas Uplift, a new Cambrian-sand pool was discovered early in 1940 on the flank of a Pre-Cambrian granite knob in southwestern Phillips County. The discovery, the result of core-drill and seismograph exploration, was Cities Service Oil Company's Ray 1, NE NW SE 32-5s-20w. The oil tests 35 degrees Baume. A Bureau of Mines analysis indicated the crude to be an intermediate base. Yield percentages were reported as follows:

Products	Percent
Total gasoline and naphtha	24
Kerosene distillate	9
Gas Oil	15
Lubricating distillate	18
Residium	34
Total	100

The composition of the Upper Cambrian or Reagan sand in the new Ray pool of southwestern Phillips County is exemplified by the following lithology[15] of Harbar Drilling Company's Ray 1, SE SW NE 32-5s-20w:

Top of the Reagan sand 3580 feet; 3580-83 feet, sand—hard with some vari-colored shale; 3583-87, sand—cemented and free different sized grains, saturated; 3587-95, sand—cemented, well saturated; 3595-99, sand—tight, lightly saturated; 3599-3606, sand—cemented, well saturated; 3606-16, sand—quartzitic, hard, barren; 3616-27, shale—vari-colored, mostly red, micaceous shale; and 3627-34, "granite wash."

The composition of the Upper Cambrian sand in the Otis gas field of Barton and Rush counties is exemplified by the following lithology of Ohio Oil Company's Brock 2, C SW 24-18s-16w, elevation, 1928 feet, completed November, 1937, for an initial volume of 100,000 cubic feet of gas daily:

Top of Reagan sand 3491 feet, datum 1563 feet; sand — finely grained, frosted, angular to subangular poorly sorted; sand—very fine grained, non-frosted, glassy, well-sorted; sand—glassy, contained small specks of black asphaltic material; sand — medium size, non-frosted, angular; sand—rounded and frosted, fine to medium, saturated; sand—glassy, fine, angular; shale—bright green; sand—white glassy; sand—glassy, very fine grained; total depth 3538 feet.

Lithology of the Cambrian sand in the Sullivan field of Russell County in Wolf Creek Oil Company's Roubach B-1, Section 15-14s-15w, is described as follows:

Macroscopic: sand — dark oil-stained brown, very hard, fine porous; *Microscopic:* sand — fine to coarse, oil stained subangular translucent (cloudy) quartz, few brown mica.

The Cambrian sand in the Sullivan pool, as in similar examples flanking this regional granite knob, is overlapped by the Lansing-Kansas City lime series of a uniform thickness of 250 feet. The Cambrian sand thins to a feather edge around the periphery of the granite knob, and in most parts of this pool is overlain by a thin, hard, white sandy-lime cap rock. One of the few areas in which commercial saturation was logged also in the Arbuckle dolomite overlying producing Cambrian sand is the Transwestern Oil Company Poulson lease. This is situated in the W½ SW 11-14s-15w. Maximum sand penetrations of 14 feet of Cambrian sand have been reported.

High productivity of the Cambrian sand is reflected by the fact that initial pumping rates as great as 2970 barrels in 24 hours have been reported in the south end of the Sullivan field. Wolf Creek Oil Company obtained this initial rate on its Roubach lease in NW 15-14s-15w, using a 54-inch stroke operated

TABLE 6
Convergence interval from top of Lansing-Kansas City to top of Pre-Cambrian

POOL AND COUNTY	Lansing Datum	Pre-Cambrian Datum	Interval
Orth, Rice	−1,094*	−1,418†	324
Orth East, Rice	−1,122	−1,457†	335
Hall, Russel	−1,132†	−1,400†	268
Niedenthal, Russell	−1,166	−1,421‡	255

* Produces commerical gas over structures from this horizon.
† Produces commercial oil over structure from this horizon.
‡ Non-commercial oil from this horizon.

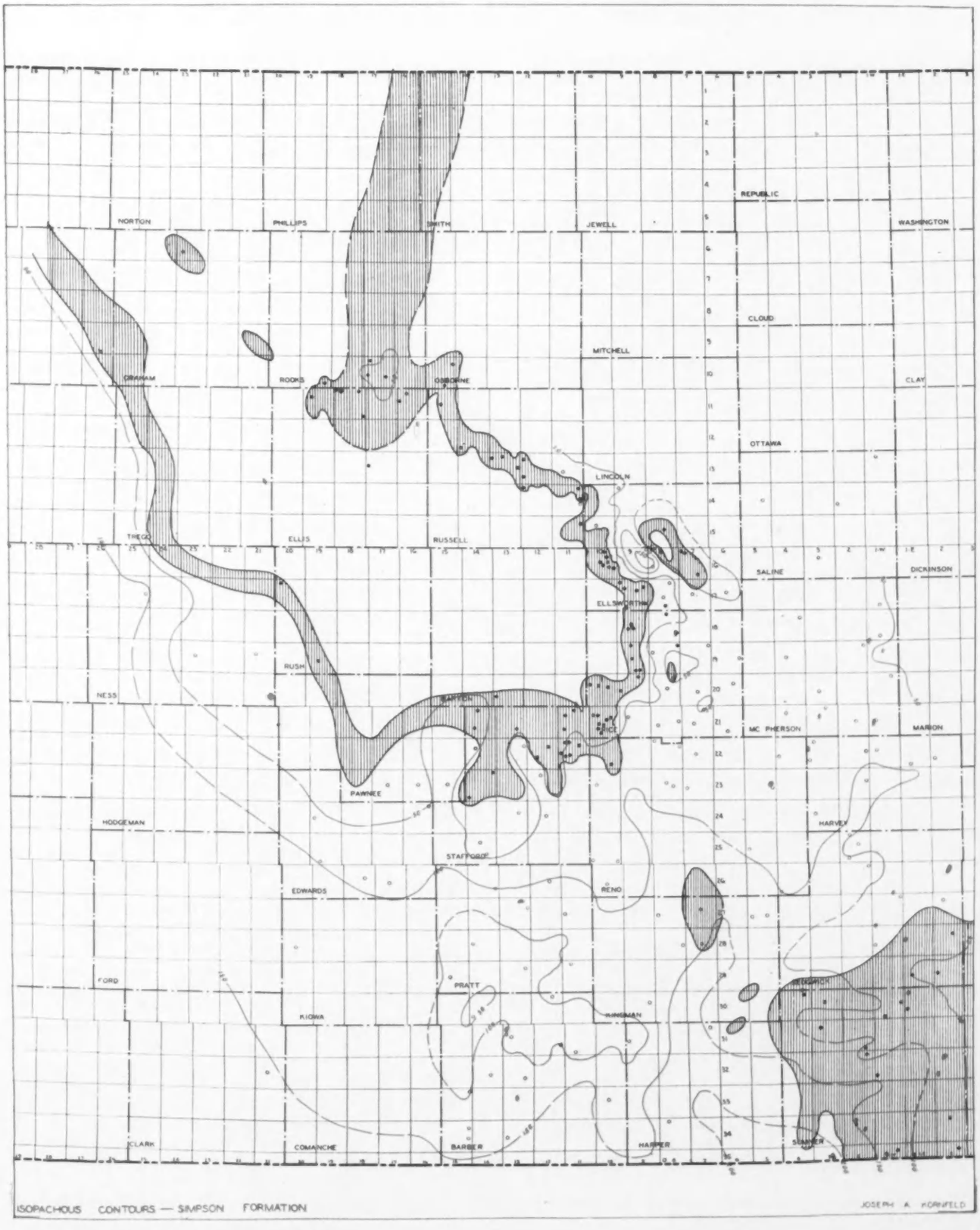
[15] Determinations by Boris V. Lerke, consulting geologist, Wichita, Kansas.

at the rate of 38 strokes per minute through 3-inch tubing. Gravities average 34 degrees in this pool.

Arbuckle Dolomite

Stratigraphic traps in the Arbuckle dolomite are encountered on the flanks of regional, buried Pre-Cambrian prominences. Their distribution is widespread along a belt approximately 50 miles long trending from north-south to northwest-southeast in Rice, Russell and Barton counties. Local accumulations are relatively small. Most of these pools, under stratigraphic conditions of accumulation are encountered on the southwest flank of the regional feature.

Otis Structure. Five miles southwest of gas production in the Otis field of eastern Rush County, an Arbuckle dolomite discovery well was brought into production during



October of 1931. An initial daily capacity of 400 barrels was indicated from a depth of 3263 feet. Lack of outlet failed to encourage development. Stratigraphic conditions of accumulation is indicated since the Arbuckle dolomite is truncated from the Otis fold for a distance of 42 miles along its major axis (northwest to southeast).

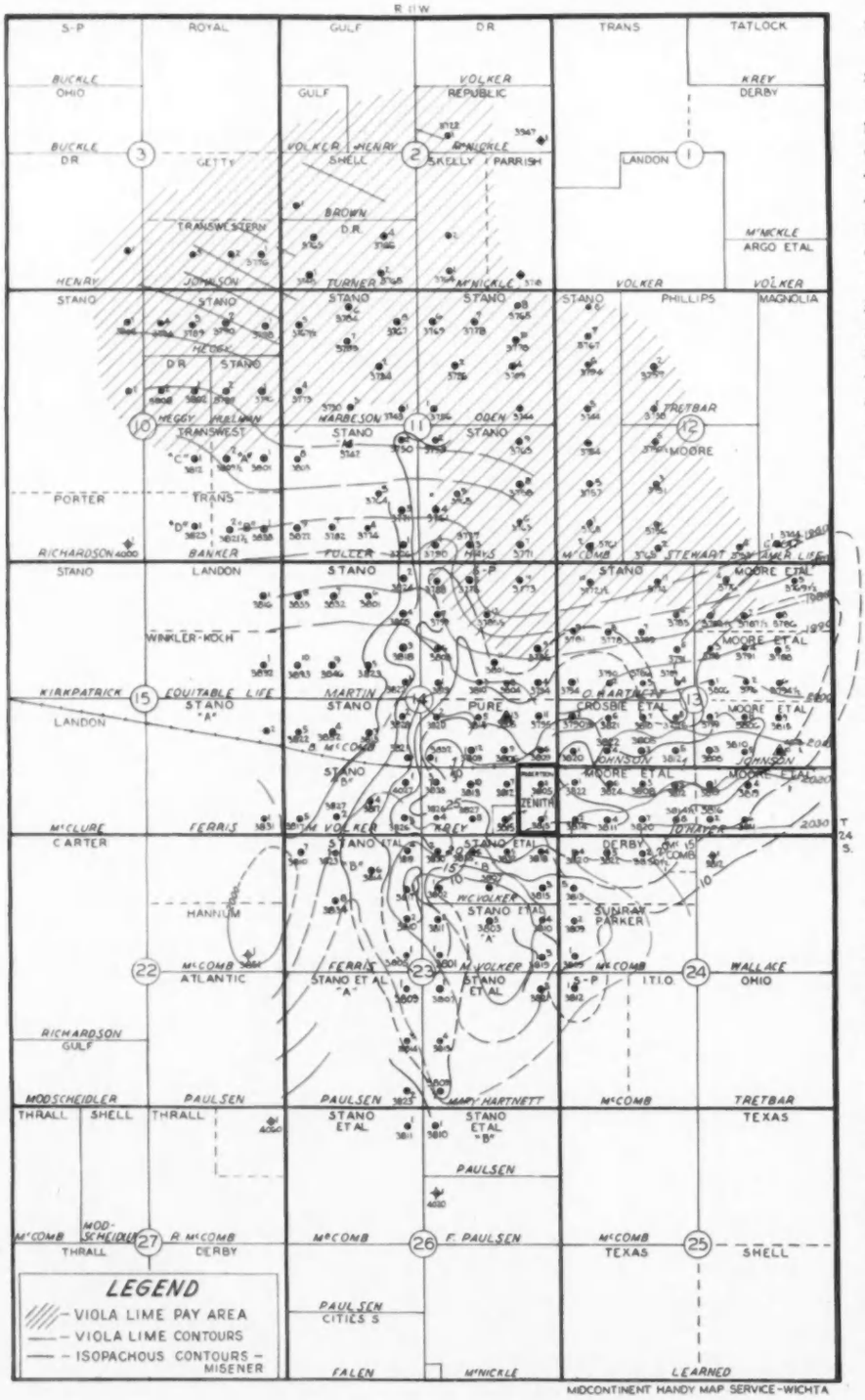
It is important to call attention to striking unconformably contacts of Arbuckle dolomite overlain directly by the Lansing-Kansas City lime series in at least three wells on the Central Kansas Uplift. Situated in Barton and Russell counties, they are:

Vickers Petroleum Company's Kerr 1, NW NW SE 15-16s-12w, Beaver field, Barton County.

The Texas Company's Moran 1, SE SE SW 25-17s-11w, Bloomer field, Barton County.

Lario Oil & Gas Company and The Texas Company's Boxberger 1, NWc 24-14s-15w, Boxberger field, Russell County.

In these three wells, the buried Arbuckle dolomite knob was so prominent that no Sooy conglomerate nor Lower Pennsylvanian (Marmaton) limestones were encountered.



Simpson Formation

The extremely variable lithology of the Simpson formation on the Central Kansas Uplift explains part of the conditions influencing stratigraphic traps in this formation. The following detailed lithology of the Simpson section is taken from the discovery well (Atlantic Refining Company's Communitized Runyon 1, SW NW NE 11-27s-13w) of the Iuka (Simpson) pool of northern Pratt County, on the south flank of the uplift:

Elevation 1932 feet; top of Simpson formation 4280 feet, minus 2348 feet; 4280-92, shale—white coarse, medium rounded sandstone; 4292-98, dolomite—small show of oil 4286-4293 feet; 4298-4309, shale—green; 4309-4335, sand—fine to medium cemented oil stains 1 foot, fine to medium coarse round frosted grains, fine to medium with secondary growth pyrite; 4335-58, shale—dark green with barren sand; 4358-76 shale—dark green with pyrites; 4376-4385, shale—dark green with trace of sand; 4385-93, shale—dark green with some fine coarse sand; 4393 (minus 2461) top of Arbuckle dolomite section; total depth 4426 feet.

Viola Lime

Since January, 1940, Viola lime production has been developed either by original completion in the Zenith pool of Stafford County, or by deepening from the overlying Misener sand, Misener dolomite or Misener chert, until an area of 1100 acres has been proven productive from this formation.

The productive relief on the viola lime at Zenith exceeds 125 feet, on a south-plunging terrace; this ranges from as high as 1871 feet minus datum at Republic Natural Gas Company's McNickle 1, CSL SW NE 2-24s-11w, in the north end of the field, to as low as 1985 feet subsea datum at Stanolind Oil & Gas Company's Opal Hartnett 8, CE½ W½ NW 13-24s-11w.

The proven area in the Viola lime occupies portions of Sections 2, 3, 10, 11, 12, 13 and 14, all in Township 24 South, Range 11 West. (See drilling rate chart elsewhere in this article for the illustration of the alternations of cavernous beds with hard, impervious layers in the Viola lime in this field. In the porous beds, penetration rates of as rapid as one foot per minute are common; at times, the drilling bit sinks nearly a foot within a few seconds.)

The productivity of the Viola lime

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formation in this part of the Zenith field is characterized by a (bottom-hole pressure) calculated potential of 20,067 barrels. This was recorded during May, 1940, at Deep Rock Oil Corporation's Turner 3, CNL SW SW 2-24s-11w, from Viola lime topped at 3685 feet and drilled to 3765 feet, 80 feet in the formation.

Two major unconformities are recognized by geologists in this field; one at the base of the Pennsylvanian Marmaton conglomerate, and the other at the base of the Kinderhook shale which verlies the dolomite at the top of the Viola (Fernvale?). In the north end of the Zenith field, a series of unconformity rocks are encountered beneath the base of the Pennsylvanian Marmaton, including red jaspolite chert, gray shale and sand lenses. The Kinderhook shale here contains white to tan gray massive chert with sand lenses of rounded to angular clusters of sandstones. Beneath this layer, may be found the true Kinderhook shale, which contains olive green to red shale of Lower Mississippian. The unconformable contact is at the base of the Kinderhook with the Viola dolomite which plunges southward.

Hunton Lime

Important oil accumulations have been developed since 1931 from the Hunton lime of Silurian age, in a limited area comprising western Harvey County, eastern Reno County, and southern McPherson County. Production is obtained from stratigraphic traps under two conditions:

(a) Wedge-outs intersecting north-south regional, secondary flexures.

(b) Local truncations over sharp anticlinal structures.

Examples of (a) are found in the northern portion of the Graber field of McPherson County and in the Nikkel portion of the Hollow-Nikkel pool of the same county.

Examples of (b) are the Sperling pool and the Hollow pool of western Harvey County and the southern portion of the Graber-Hunton pool.

Depth to production in the Hunton lime in these pools ranges from as shallow as 3274 feet to as deep as 3585 feet.

Gravity of Hunton lime oil ranges from 35 to 43 degrees Baume.

Although the greatest recorded thickness of Hunton limestone is approximately 90 feet in western Harvey County, much of this is reworked detritus and erosional material. Consequently the average thickness will be found to be closer to 40 feet. Sharp thinning over local structure is a characteristic of the Hunton limestone in this immediate area, due principally to broad truncation and subsequent erosion in post-Hunton Pre-Kinderhook time.

Misener Formation

Goodrich Pool. The Misener formation in the Goodrich pool of Sedgwick County is a dolomite and is a re-worked zone probably derived from the Hunton lime lying northward in Harvey and McPherson counties.

Ver Wiebe[16] has described its lithology as a brownish, sandy, dolomite, granular in texture. It is found at 3334 feet, intercalated between typical Chattanooga shale, and a lower shale that is probably part of the Chatanooga shale. Considerable water is produced with the oil.

The author holds to the belief that it represents the oldest of the several Misener deposits in western Kansas; other deposits described occur as unconformity sands and limes representing the base of the Mississippian deposition beneath the Kinderhook green shales.

Graber Pool. The Misener sand in the Graber pool of southern McPherson County, produces oil on the northwest flank of the Graber fold, hence accumulation is partly due to anticlinal structure. Twenty feet of Misener sand was encountered at Derby and Wentz Goering 1, SE NE 17-21s-1w, from 3323 to 3343 feet. This well is located just north of the strand line of the Hunton lime, and is underlain unconformably by Sylvan-Maquoketa dolomite.

Hesston Pool. The deposition of Misener sand thins to only 10 feet in the discovery well of the Hesston pool, in northern Harvey County. There, the Misener is fine-grained, clear, angular, poorly-cemented quartz grains. It is underlain by a 50-foot thickness of Hunton lime, and is overlain by the typical green-gray Kinderhook shale, carrying *sporangites* at its base. The discovery well, Derby Oil Company and Earl K. Carey's D. B. Jones 1, C E½ NE NW 7-22s-1w, was completed for an initial potential of 254 barrels of oil per day, from Misener sand, logged from 3279 to 3289 feet. It is situated on the northeast-southwest fold extending from Graber, through Hesston, and towards Sperling pool.

The Hesston area remained an island during Kinderhook time, as shown by the thinning of Kinderhook from 97 feet in the Derby-Wentz Goering 1 at Graber to only 15 feet in the Sperling field as in NW 13-22s-2w.

The Misener sand occupies an elongated sand lens on the east side of the Zenith field. The lens unconformably overlies the eroded, truncated Viola lime on the east flank of a local south-plunging terrace. The sand lens covers approximately 1600 acres in Sections 2, 11, 12, 13, 14, 23, and 24, in Township 24s Range 11w, just west of the Reno County boundary line but in southeastern Stafford County.

Along a north-south line, it thickens from 4 feet in CSL SW SE of Section 2, in the north end of the field to a maximum thickness of 30 feet in SW NW SE of Section 14 in the center of the field, thinning southward to only 3½ feet in SE SE SW Section 23. On the west side of the field, it thins to a feather edge along a north-side strand line, where it is unconformably overlapped by an isolated layer of white limestone which attains maximum thicknesses on the west side of the field; these thicknesses range up to 22 feet in SE SE NW Section 11; as high as 21 feet in the CW½ SE NW of Section 14, and 18 feet in C W½ NE NE Section 14; this limestone unconformity zone thins out to a feather edge eastward covering nearly half of the principal Misener sand lens. In the north end of the field, the limestone layer overlies unconformably the Fernvale member of the Viola lime, rests on the middle Trenton zone of the Viola lime in the middle of the field, while southeastward, it overlies Misener sand.

The Kinderhook shale found above this limestone layer in the center of the field, overlies Misener sand on the east and southeast sides and unconformably overlies Fernvale Viola lime at the north end of the field. Following the deposition of the Kinderhook shale, Basal Pennsylvanian detrital beds were laid down in the north end of the field centering around Sections 2, and 3; these comprise four lenses of detrital sand, gray shale and red jaspolitic chert of Marmaton age. There are no Cherokee beds of Lower Pennsylvanian represented in this field, the highest major unconformity of local importance to oil and gas accumulation being the base of the Marmaton, which is the top of the Kinderhook shale, an erosional contact.

The Misener sand in its thickest section in the Zenith field shows the following lithology:

Macroscopic: light-gray, black-

[16] Ver Wiebe, Walter, A. "Exploration for Oil and Gas in Western Kansas During 1939," State Geology Survey of Kansas, Bulletin No. 28, page 87.

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speckled friable fine to medium-grained porous sand.

Microscopic: fine to medium vitreous crystal quartz, brown fish bones, black chert and few heavy minerals.

Medicine Lodge-Misener. Southwest of Medicine Lodge in central southern Barber County, commercial oil production has been obtained from an unconformity sand, called the Misener of lower Mississippian age, overlying the Viola lime. The discovery well in this horizon was brought in during March, 1937, at Barbara Oil & Gas Company's Holmes 1-A, C SE 15-33s-13w. An initial production of 441 barrels of oil daily from sand section logged at 4845 to 4847 feet, was reported.

One fourth mile northwest of the discovery, another oil well was completed in this same horizon early in July, 1939; it was Barbara Oil & Gas Company's Holmes 3-A, CNL SE 15-33s-13w, which flowed 45 barrels of oil hourly during an 8-hour test after being deepened to 4865 feet in Misener sand topped at 4858 feet.

Lithology of this formation, as identified from a test drilled through the same horizon two miles to the west, may be described as "rounded, frosted quartz grains." In both areas, this unconformity sand is overlain by Mississippian Kinderhook shale, and is underlain unconformably by the Viola lime.

Mississippian Chat

Barnholdt Pool: One of the most consistent stratigraphic discoveries during the past three years in Western Kansas is the Barnholdt pool lying in southwestern McPherson and southeast Rice counties. The field, discovered during August of 1937, is producing from the eroded Mississippian chat. Its structure is that of an east-pitching monocline with no closure recorded although it is modified into a southeast-plunging terrace. Accumulation is due to the wedge-out of the Mississippian on the southeast flank of the Central Kansas uplift. A strong hydrostatic head on the east side of the monocline provides the propelling force, the original oil-water contact being approximately 1850 feet. The size of the reservoir may be realized from the fact that the vertical productive relief is 116 feet; this is observed from comparing the highest producing well in the field at a minus datum of 1729 feet at Republic Swanson 1, C S½ NW SW 18-20-5w, with the lowest producing well having a minus datum of 1845 feet at Mid-States Oil Corporation's Mattson 1, CW½ NW NE 29-20-5w.

The basal Pennsylvanian conglomerate (Sooy) overlies the Mississippian chat, while the formation is underlain successively by Sylvan shale, Viola lime, Decorah shale, Simpson formation, Arbuckle dolomite. The Hunton edge line passes to the southeast of the pool.

Sooy Conglomerate

As described earlier in this report by Edson, the Sooy conglomerate has no definite stratigraphic position, resting on beds ranging from Pre-Cambrian to Upper Bendian; it is overlain by beds ranging from Morrow to Upper Lansing. Of the many stratigraphic traps encountered on the Central Kansas uplift, it is found over the greatest geographical area representing largely reworked detritus from the old land surface.

As would be expected, it exhibits the greatest variation in oil gravity, ranging from as low as 23 degrees Baume in the abandoned Webster discovery well in Rooks County on the northwest flank of the uplift, to as high as 47 degrees in the Rickard pool discovery well in Rice County on the east flank of the regional buried prominence.

Wide ranges in gravity may occur in different lenses on the same structural terrace. As an example, 38-gravity (Baume) oil is found in the Wherry East pool in Section 12-21s-7w, whereas only 1½ miles to the west, 32-gravity oil is produced in the Wherry pool proper. In general, these accumulations overlying the highest structural contours of the Central Kansas uplift carry the highest gravity oil, among this particular group of stratigraphic tracts.

Two small gas-producing areas have been discovered in the Sooy, the 3-well McCarty (abandoned) gas pool of Edwards County on the southwest flank of the uplift, and the single-well Bison gas pool of Russell County on the buried Otis Pre-Cambrian arch.

The Gorham sand phase of the Sooy conglomerate occupies the flanks of local eroded Pre-Cambrian structures in southern Russell and northeastern Barton Counties. Here it overlies successively Pre-Cambrian granite, Upper Cambrian basal sand, and Arbuckle dolomite. It is overlain nearly everywhere by the Lansing-Kansas City lime series and in a few places by red shales and limestones of Marmaton age.

The following crude oil evaluation furnished by Derby Oil & Refining Corporation of Wichita, is typical of the Wherry pool of Rice County; producing from the Sooy conglomerate:

Gravity, A.P.I. deg.	35.9
Gasoline 410° E.P.	34
Kerosene 510° E.P.	10
Distillate 572° E.P.	8
Basic sediment and water	0.15
Lead to sweeten gasoline	1.5

(Lead number of 1 indicates 1.4 lbs. of litharge required per bbl. gasoline.)

Marmaton Lime Series

The first commercial production definitely recognized from the Marmaton formation over the Central Kansas Uplift is that from the discovery well of the Rega pool of Trego County. The discovery was brought in on May 19, 1929, by Central Commercial Oil Company's King 1, NE SW NE 20-13s-21w. Marmaton pay was topped at 3960 feet and drilled to 3972 feet, total depth. Initial production was 284 barrels of 34-gravity (Baume) oil. After recompletion in 1930, the well was produced for the following two years before being abandoned. The area lies on the northwest flank of the uplift.

The Marmaton group in the Des Moines series of Lower Pennsylvanian age is comprised of the following formations, according to Moore's classification[17]: Memorial shale; Lenapah limestone; Nowata shale; Altamont limestone; Bandera shale; Pawnee limestone; Labette shale; and Fort Scott limestone.

An unconformity separates it from the overlying Bourbon group of the Missouri series. Marmaton is conformably underlain by the Cherokee shale series in eastern Kansas. However, over the Central Kansas Uplift, the Cherokee shale group is absent, while in places the Marmaton and Bourbon groups are absent by truncation and partly by non-deposition. The Fort Scott basal member produces oil on the east flank of the Aldrich anticline in western Ness County west of the uplift.

Lithology of the Marmaton changes markedly over the Central Kansas Uplift. In the Ray pool of Phillips County, the Marmaton section, described by Lerke, is carried as follows according to studies of Harbar Drilling Company's Ray 1, SE SW NE 32-5s-20w:

3540-50, shale—vari-colored; 3550-60, shale—vari-colored with some micaceous cemented sand; 3560-65, shale—vari-colored with some limestone and micaceous cemented sand; 3565-3570, shale — same; 3570-73, shale—same with some brown lime and micaceous cemented sand; 3573-78, limestone—white, pyritic; 3578-80, limestone—same with traces of sand; 3580, Regan sand.

[17] Moore, Dr. Raymond C., "Stratigraphy of Kansas," Oil & Gas Journal, June 27, 1940, page 73.

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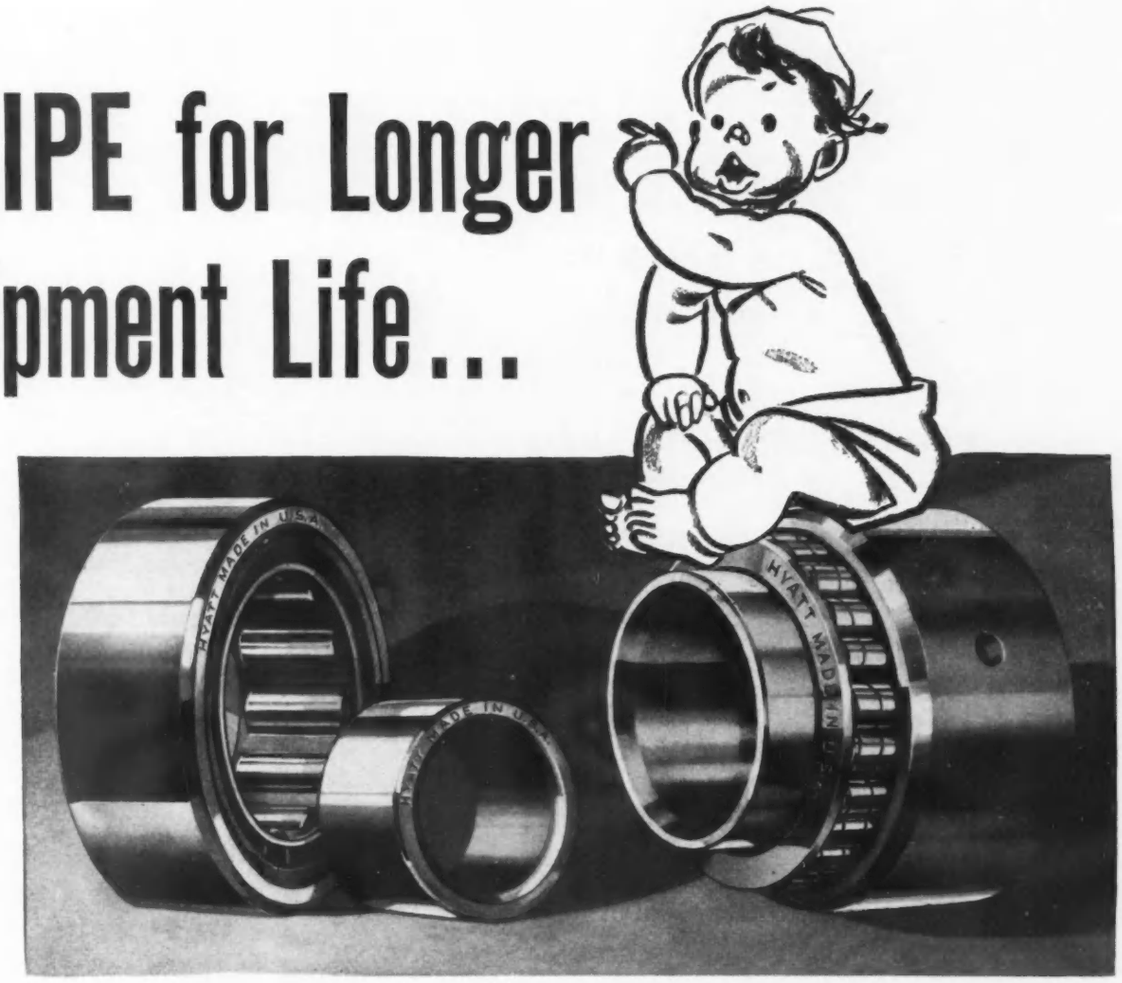

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DRILLING CONTRACTORS' NOTEBOOK

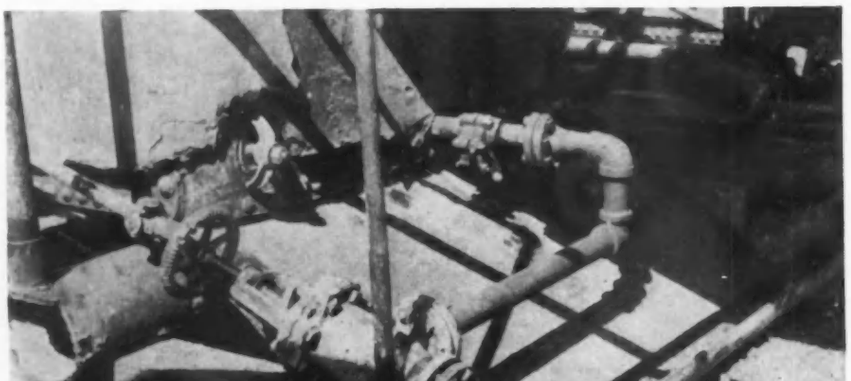
Helpful Suggestions For Those Interested In Drilling Methods

Operating Ideas Maintenance Hints New Rig Hook-ups

Published as a regular feature of THE OIL WEEKLY

1. BOILER SETUP

Steel Plate and Trough Conduct Drippings Away from Boiler Site



This apron, attached to the fire-box section of the boiler, catches drippings and delivers them to a collecting trough from where they are conducted from boiler site.

RECENT drilling and development practice in California has shown it to be more economical to erect a battery of five to eight boilers at a centralized point on the lease, using them for drilling as many wells as possible by extending insulated steam lines to each location, instead of moving the boilers each time.

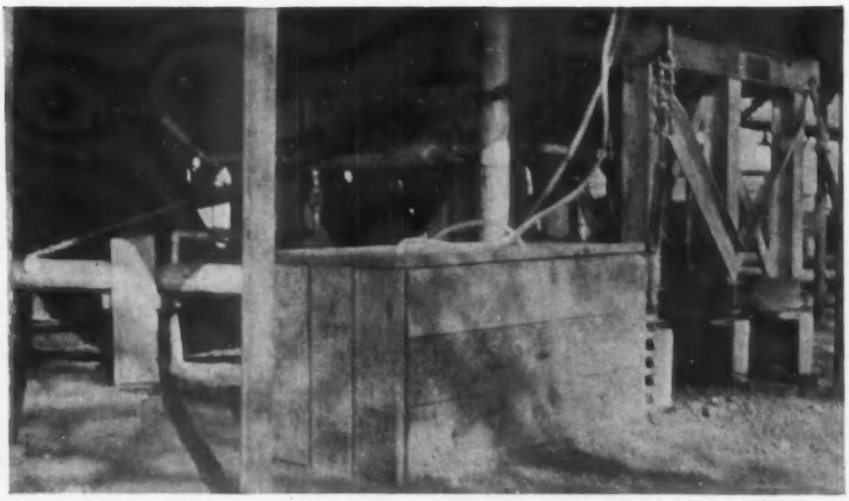
Because of the semi-permanent nature of such boiler locations, one company has made a policy of eliminating one of the common sources of mud and water that ordinarily soon accumulate beneath and around each boiler. Skids of 3/16-inch flat steel, with the two sides flared up an inch or two, are bolted to the base at the rear of the fire-box section of each boiler, slanting downward at approximately a 30 degree angle, allowing water to run down and empty into a common collecting trough. The trough, made of 8-inch casing, split, slopes and conducts the waste water away from the boiler setting.

The pan and trough catches drippings from blow-off valves and fittings, as well as waste material that is periodically cleaned out through the hand-holes near the base on each side of the boiler. Cleaner and safer working conditions for the men have proven worth the slight extra cost of making this standard equipment on each boiler setting.

2. ROPE CARE

Storage Under Floor Of Derrick Provided

TO PROTECT unused catline or derrick-line manila rope, a box may be placed on the ground, or on sills beneath the draw works building at a well, with a lid with holes through which the rope is pulled as required. The box is made of 2 x 12's and has a plank cover, cleated and fitted with hinges. The front side is merely toe-nailed to



This box beneath derrick floor protects unused catline, keeps it readily available.

A 2-inch pipe takes part of the drilling mud from the main stream to a sample box

support the planking, and may be removed easily when a new bale of rope is to be placed in the box.

3. MUD HANDLING

Sample Box Served By Small Pipe

A 2-INCH pipe inserted in the larger pipe carrying drilling mud from the surface pipe to the mud pit will divert part of the mud and cuttings to a sample box without using the entire stream to separate the samples. The outer end of the 2-inch pipe can be placed at the most convenient point at the rig, with the mud flowing through or into a strainer to separate the cuttings from the mud.

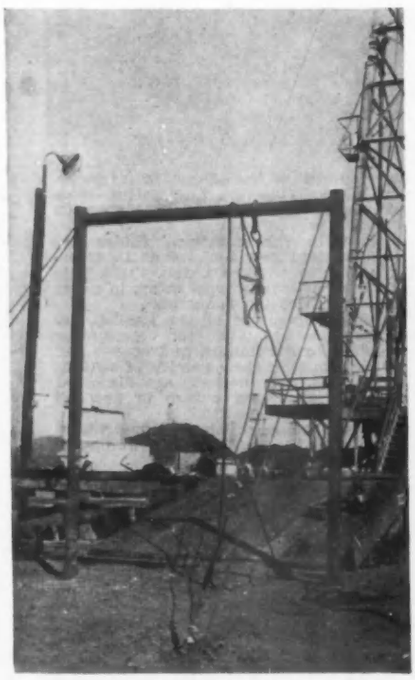
4. RIGGING UP

Highline Support Aids In Truck Unloading

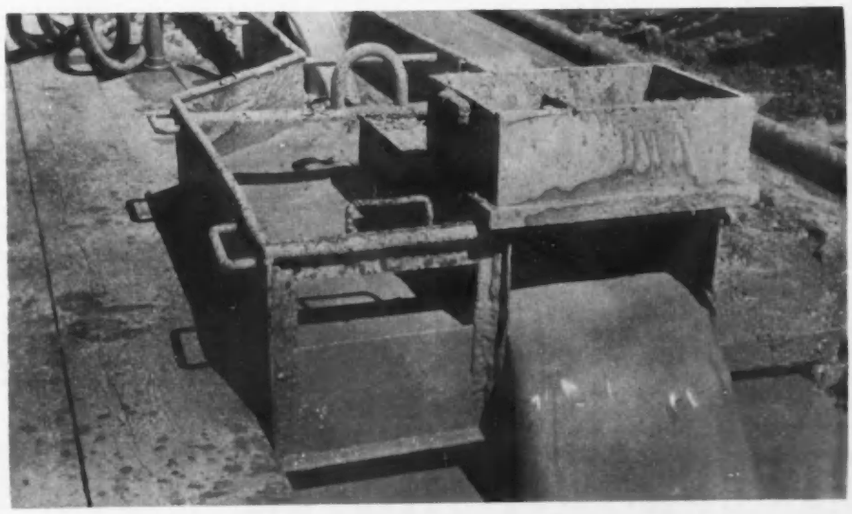
A CALIFORNIA company departs from the usual practice of setting a single, guyed vertical post to serve as a support for the cathead highline by using two vertical posts of 6-inch casing with a horizontal member across the top, set wide enough apart to permit an oil-field truck platform to pass between them. The posts are placed several feet from, and in front of the ramp leading up to the walk on the pipe rack. They extend approximately 12 feet above the ground.

A cross bar of 6-inch pipe, to the center of which the highline is tied, accommodates a hitch and small pulley by means of which the truckman can pick up from the ground or lower from the truck bed, tools or equipment that might otherwise require skids or landing blocks. Comparatively small but heavy objects, such as rock bits and drill-pipe subs, are unloaded more safely and in a shorter time.

Another feature makes the unit portable when changing locations. Instead of setting the two posts in concrete, two 30-inch sections of 7-inch pipe are set, into which the 6-inch posts can be inserted snugly. The short sections of pipe project above the ground several inches. Four 1-inch nuts, tack-welded around each 6-inch leg approximately 2 feet above the bottom, permit the posts to rest upon the top of the 7-inch sections, preventing the support from settling into the ground too far. Turnbuckled guy lines hold the framework firmly in place. In moving, the entire support is picked up, carried to the next location, and placed in previously set bases.



This standard for the cathead highline also facilitates unloading of trucks.



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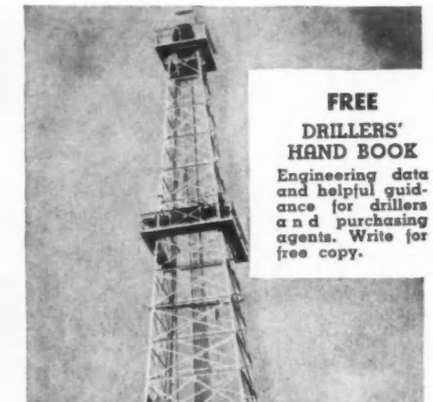

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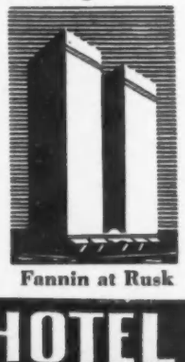

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By S. F. SHAW, E.M.
Consulting Engineer

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A history of the development of the air-gas lift is given, covering operations in air and gas-lift, and noting some of the inventions that have been patented in connection with this work.

The performance data in the numerous tables are selected from some 15,000 actual field tests made to determine the best rates at which to produce a well, these tests being made by the author or under his supervision, in many fields of the United States and foreign countries.

The principles controlling operation of the gas-lift are discussed, curves and formulas are given for determining the quantity of gas required to lift liquids, and curves and formulas are given for determining the capacity of various sizes of pipes in certain fields, and methods are discussed for determining similar formulas and curves in new oil fields.

A lengthy discussion of the selection of compressors and building of plants suitable for handling gas-lift operations is given.

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HIGHLIGHTS IN THE WEEK'S NEWS

Washington

Charge Oil Companies Fail To Remedy Alleged Abuses

Disclosure of monopolistic conditions and abuses in the oil industry through an exhaustive investigation of the Temporary National Economic Committee has failed to influence the major companies to take remedial action, it was charged last week in a progress report by Dewey Anderson, executive secretary of the committee.

Simultaneously with publication of the report, Chairman Joseph C. O'Mahoney admitted at a session of the committee January 15 that he is resigned to the probability that, because of the urgency of the defense effort, no more than scant attention will be given to recommendations made by the TNEC for the elimination of monopoly, but warned that at the end of the emergency there will still remain an imperative necessity of protecting small businesses from the ravages of their large competitors.

In his statement, the chairman declared that the country is confronted with the "appalling alternative of so adjusting our economic mechanisms as to preserve free, private enterprise and enable it to provide stable employment for the masses or of seeing big government in one form or another, take over the controls."

Discussing the investigation of the petroleum industry, Anderson called attention to its "highly concentrated" character which, he said, was shown by the fact that in 1938, 20 companies "owned $8,000,000,000 of invested capital, two thirds of the total capital invested in the industry; their production was 52 percent of all crude, their storage 94 percent of all crude; they owned 75 percent of all refinery capacity, produced 84 percent of all gasoline.

"Only 16 companies, however, control 96 percent of the gasoline pipe line mileage; 14 companies control 89 percent of the total crude oil pipe line mileage in the United States," he added. "The ownership and control of these pipe lines remain a key to monopoly or competition in the industry." Anderson pointed out that the relationships of production, transportation and distribution of oil products were fully analyzed in the hearings, which lasted a full month and developed over 3000 printed pages of testimony.

"Much attention was devoted to the practice of the major companies known as the Iowa Plan, whereby filling stations were leased to operators who were required to handle exclusively the products of the lessors," he commented. "The practice was condemned as a further monopoly control extending into the retail aspects of the oil business. Mr. Howard Pew, president of the Sun Oil Company of Philadelphia, impressed by the hearings, recommended the abandonment of the Iowa plan in his 1940 annual report to his company.

"But while the facts concerning the operations of the petroleum industry are contained in the hearings of the TNEC," he concluded, "it cannot be said that the problems raised there have been solved through the voluntary action of the major companies. Since the hearings were conducted, your committee has been urged by independent producers to afford them further opportunity to present their case in order that some conditions more favorable to competitive operations might result."

Another Company Cleared In Madison Trust Case

Trial of Tide Water Associated Oil Company and three of its executives on charges of violating anti-trust laws, scheduled for January 20 at Madison, Wisconsin, was precluded last week when Federal Judge Walter Lindley dismissed charges against the company and one individual, and accepted pleas of nolo contendere and fined two officials.

The government's motion to dismiss was sustained in the case of Edward L. Shea, New York, former executive vice president of the company. Fines of $5,000 each were assessed on three counts against J. W. Warner, Tulsa, Mid-Continent sales manager, in one indictment, and in the same amount against Noel Robinson, former vice president, and Warner on another indictment.

The indictments were returned by a federal grand jury in 1936.

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Allowables

Call Oklahoma Allowable Meeting for January 30

W. J. Armstrong, chief conservation officer of the Corporation Commission of Oklahoma, has called a meeting of purchasers and producers for 11 a. m. Thursday, January 30, to discuss conservation rules and regulations affecting all pools in the state and determine the daily crude allowable for the months of February, March and April, 1941, or for any one of the three months.

Texas Board Rules No More Interim Allowable Changes

Operators appearing before the Texas Railroad Commission at the statewide proration hearing held in Austin last week indicated that they were satisfied generally with the allowables which were currently in effect. While there were several requests for allowable increases in particular fields, most of the operators showed a desire to keep Texas within the Bureau of Mines estimate of consumer demand.

Several operators were queried by the commissioners as to their attitude concerning the demand estimate, and in virtually every instance, they replied that the allowable should be kept down. Speaking for Gulf Oil Corporation, however, P. O. Settle, attorney, said that the commission might well exceed Bureau of Mines estimates for defense purposes. E. H. Foster of Phillips Petroleum Company indicated he thought this need not be the only guide to allowable determination.

The commissioners restated their policy concerning allowable changes. They announced that in the future no allowable increases or decreases would be ordered during the interim between statewide hearings after the statewide order had been promulgated. Special hearings would be held as particular situations arose in individual fields, but no change would be made until after the following statewide hearing, at which the records made in the special hearings could be incorporated into the record of the statewide hearing.

The commissioners also restated their determination to keep Texas production within consumer demand as estimated by the United States Bureau of Mines.

Policy on New Fields

As another indication of the establishment of fixed policies, the commission had read into the record a recommendation for Dr. F. V. L. Patten, chief supervisor of the oil and gas division, providing for allowables for new fields. Chairman Ernest O. Thompson warned operators not to be surprised if the recommendation was established as a permanent policy. Under the plan, new fields would be recognized with higher allowables during the first few months of their producing life. The recommendation in full is set out below:

"Believing that a definite policy with

reference to allowables granted newly discovered fields would be advantageous to the commission as well as to operators, we recommend the following scale of allowables based on depth for allocation to new fields only:

Depth Feet	Barrels
9000-10000	150
8000-9000	135
7000-8000	120
6000-7000	105
5000-6000	90
4000-5000	75
3000-4000	60
2000-3000	45
1000-2000	30
Less than 1000	15

The above allowables to remain in effect for a period of 4 months or until 5 wells have been drilled. At the completion of the sixth well, the allowable for 5 wells would be distributed equally among the 6 wells. Upon completion of the seventh well, the allowable for 5 wells would be divided between the 7 wells, and so on.

"It is also recommended that this division be continued upon completion of each new well until the per-well allowable is commensurate with that of wells in the other fields in the same district or area in which the new field is located, which produce similar crudes."

One of the principal difficulties reported by operators was the Phillips Petroleum Company's situation in the Panhandle, where it has on hand only enough oil to last until February 10. The company has been withdrawing from storage consistently for several months, and although some oil has been purchased from other companies, no more of this is available, and an increase in allowable is the only solution that could be found. The company asked that the Panhandle allowable of 83,916 barrels daily be exempt from shutdown orders, or else that the field allowable be raised to 119,000 barrels per day. Evidence was presented to show that these amounts could be produced without waste. The company expressed a desire to increase its storage to 1,500,000 barrels, a gain of approximately 1,000,000 barrels.

Sinclair Prairie Oil Company requested increases in Bonita, Walnut Bend, and K-M-A. Commissioner Sadler charged that these requests were unfair, especially in the Bonita field, where there are 20 wells and the company nominated 300 barrels daily.

Sinclair Pipe Line Company is building a line from Corpus Christi to the East White Point field, where 20 wells are drilled on submerged lands. Under terms of this lease, the company must recover the oil within 25 years, title reverting to the state thereafter. The allowable for the wells now is 30 barrels, and the company will want 75 barrels after January 20 when the pipe line is finished. Chairman Thompson suggested that the company take this case to the legislature, inferring that it might ask for an extension of the leases.

Texas Stocks Being Reduced By Current Curtailment Rates

Finding markets for Texas oil is a difficult problem, according to a statement issued last week by Railroad Commission Chairman Ernest O. Thompson. The statement in full is set out below:

"The Bureau of Mines official reports on stocks of crude oil show the Texas origin crude stocks were reduced 1,100,000 barrels during the week ending December 28, 1940, and Texas originated crude stocks were further reduced 1,211,000 barrels during the week ending January 4, 1941. This shows Texas is reducing her surplus regularly and in an orderly manner.

"The crude-stock picture is made more optimistic by the fact that these reductions are being made contra seasonal. That is, Texas is wisely reducing her crude stocks at and during the season when crude oil stocks are generally increasing due to the winter demand being off as compared with the other seasons. It is doing double good in the job of working off excessive stocks.

"At the hearing Thursday, we can ascertain if there still be too much crude oil in storage of Texas origins.

"Crude reductions of a million barrels or better per week should promptly correct the over-stored conditions that so many experts have been complaining about.

"On January 4, 1941, there were 260,643,000 barrels of crude oil in storage in the United States.

"Our duty is to limit production to market demand. If we produce too much, it will only go to storage and cause unnecesary and preventable waste. Of the 260,000,000 barrels of crude in storage, Texas crude totals 82,303,000 barrels. Some experts have estimated that a desirable and adequate Texas crude storage should not exceed 75,000,000 barrels.

"If such a figure should be approximately correct, we would at the present rate reach that desired point of adequate, but not unnecessarily large stocks of crude within six or seven weeks.

"Thus, a continuation of our present order in general for February and March would just about achieve the nearest to the perfect crude stock picture ever achieved.

"The decline naturally will not be so large in February and March as in past weeks, for normally we can expect cold weather in these two 'dead of winter' months.

"Texas crude stocks on:
December 21, 1940....84,622,000 barrels
December 28, 1940....83,512,000 barrels
January 4, 1941.....82,301,000 barrels
This shows the steady decline due to curtailed and controlled production in Texas.

"The Bureau of Mines forecasts the amount of oil needed from each state. It can come either from storage or from current production.

"It is better in order to prevent waste never to produce more than is needed and to keep stocks at a required minimum.

"If at any time, additional crude is needed, Texas can and will promptly produce it by taking off a day's shutdown or two day's shutdown.

"Our problem, as is the oil problem generally, is to find markets.

"If National Defense needs more oil, we can promptly supply it. All we need is to be told by the Bureau of Mines the additional quantity needed. This is laid down in their forecast furnished, and regularly followed by, the Railroad Commission of Texas. We intend to follow them religiously.

"Texas was under the Bureau in 1939 and 1940. She will not exceed the Bureau in any month in 1941."

Texas Revises Practice on Granting Well Permits

The Texas Railroad Commission, through its chief deputy supervisor of oil and gas, has announced that no more drilling permits will be granted as exceptions to Rule 37, unless a hearing has been held.

Heretofore, it has been the practice in fields other than East Texas, to approve these permits as exceptions when all other operators waive notice and hearing in writing. The result has been than only a short time elapses between the receipt of the application and permission to proceed with the well.

Considerably longer time will be required to handle such applications under the new program. The commission must give ten days notice before hearing is held, and because of the large number of exceptions which are applied for, especially since the inauguration of the state-wide 20-acre spacing rule, cases will be set a month or six weeks after the date they are received.

Michigan Operators Protest Proposed Proration Change

Proposed revision of Michigan proration rules to fix allowables on an individual well basis, instead of on the lease-wide method used since state proration was adopted in May, 1939, was opposed generally by operators at a hearing January 13.

P. J. Hoffmaster, state oil and gas supervisor, said the revision was considered as a means to remedy "certain probable or potential inequities" permitted where big wells may be pulled above the proration maximum to make up for small wells on the same lease. The order, if issued, would not apply to present known fields, he said.

Under the present Michigan proration method, only flat well allowables have been applied, without particular bearing on gas/oil ratios, bottom-hole pressures or reserves. The acreage factor has been employed with 10-acre units as the base indice. Smaller units are discouraged, but not prohibited other than by reduced allowables. Larger units are encouraged by proportionately greater allowables.

Opposes Well Method

W. A. Watkins, eastern division production manager for The Carter Oil Company, Mattoon, Illinois, warned that any method setting up the individual well potential as the basic index was a vicious system to be avoided. He said it would encourage closer spacing, undesirable deep drilling in pays, and encourage big and unnecessary costs to pull the ultimate production from small wells.

Harold Wright, Indianapolis, eastern division production engineer for Gulf Refining Company, likewise opposed any plan "where individual well potentials become the key to proration." He proposed an alternative that would leave flat lease allowables in effect, but which would set a ceiling on big wells.

Operators expressed doubt that the individual well method could be adopted without additional storage equipment. Hoffmaster said no plan that would burden operators with extra costs would be considered.

Legislation

First State Moves to Adopt Compact's Model Law

The legislative week saw the first action by a state department toward enactment of a model conservation statute written by the Interstate Oil Compact Commission, while bills affecting the producing and pipe-line divisions of the industry were introduced in several other legislatures. The governor of a state not at present oil-producing urged a state bonus to encourage exploration.

The Kansas Corporation Commission, through its chairman, Andrew F. Schoepple, urged revision of the state's conservation statute to make it closer to the pattern law advocated by the compact. A bill to effect necessary refinements in the present Kansas statute was being prepared for introduction. The legislature convened January 14, and will be in session for 50 days.

Oklahoma Wants Full Tank Tables

Measures seeking to provide purchases of crude oil on 100-percent tank tables and to tax royalties were among bills introduced in the Oklahoma legislature. A house bill would prohibit "strapping . . . or in any way discounting, docking or shorting" crude oil for "waste, shrinkage or other causes." It would void the deduction or strapping clause in crude-oil purchasing contracts or division orders, and a section makes deductions a misdemeanor and permits the producer to sue for four times the value of such deducted crude on purchases.

A campaign to eliminate the 3 percent deduction allowed in Oklahoma was launched late last year by the Oklahoma Stripper Well Association. Indication that it would not be strenuously fought by purchasing companies may be seen in action of The Texas Company and Texas Pipe Line Company, which two days after introduction of the bill announced adoption of 100-percent tank tables in Oklahoma, effective February 1.

Kansas, besides Oklahoma, is the only state allowing purchases on 97-percent tank tables, while oil is bought on 98-percent tank tables in Montana and Colorado, on 99 percent basis in Louisiana and Wyoming, and 100 percent in Texas and New Mexico.

Another Oklahoma house bill, referred to the committee on revenue and taxation, would tax oil and other mineral royalty owners 10 cents per acre on their holdings when mineral rights and surface rights are not held by the same person. The author, J. H. Harbison, Marshall County, said purpose of the bill is to induce owners of relatively worthless royalty to turn back their holdings to the surface owner, or in the case of valuable royalty holdings, to raise revenue.

"In our county, many farmers make application to purchase land with the help of the federal government," Harbison said. "But insurance companies won't release the mineral rights, which are in many cases of doubtful value. And the federal government won't lend on land where ownership of rights is divided."

With a bill introduced a week ago calling for an increase in the gross-production tax from 5 to 7 percent, the Oklahoma Farmers Union has announced it would seek an increase to 8 percent. Another house bill would levy an excise tax of ⅛-cent a barrel on all petroleum produced in the state, with ⅞ of the proceeds allotted to the conservation fund and ⅛ to the Interstate Oil Compact Commission.

Boyd Cowden, of Chandler, is chairman, and Phil H. Lowery, of Loco, is vice chairman of the Oklahoma Senate's Oil and Gas Committee. Members are Tom Anglin, Holdenville; Robert Burns, Oklahoma City; Floyd E. Carrier, Carrier; E. F. Cornels, Sayre; S. E. Hammond, Okmulgee; Ray C. Jones, Stillwater; John B. McKeel, Ada; James C. Nance, Purcell; Mead Norton, Shawnee; Homer Paul, Paul's Valley; H. V. Posey, Durant; John Sanford, Pawnee; R. H. Sibley, Pryor; Gerald Spencer, Chickasha; Paul Stewart, Antlers; Joe B. Thompson, Ardmore; Murrell H. Thornton, Muskogee, and Henry C. Timmons, Tulsa.

Texas Tax Threat

The Texas legislature heard Governor Lee O'Daniel ask for $61,000,000 in taxes. Of this sum, $50,000,000 would be raised through a transaction tax of 1.6 percent on all sales, including petroleum, and the remainder would be raised by an omnibus tax bill.

The omnibus bill would raise the levy on oil from 2¾ to 3¾ percent, place a tax of ½ cent per thousand feet on natural gas, and raise taxes on utilities. The Governor explanied in his message, however, that he was not wedded to the bills he offered, but that he would accept other measures which would raise the money.

The tax bills, he urged, should be passed within 30 days.

O'Daniel also condemned lobbyists, and urged legislators to disregard them. He asked for the power to fire as well as hire officials whom he is empowered to appoint, contending that this is the only manner in which he can demand good service.

Into the senate came a bill by Weaver Moore, Houston, providing for extension of conservation laws which expire in September.

Senators Martin and Moffet introduced a bill providing for a new conservation commission of three members to control oil and gas production. This commission would supplant the Texas Railroad Commission in this work.

A bill introduced by Senator Chadick provides for proration of production from distillate wells, one of the most controversial problems which is likely to come before the legislature.

Included in the program launched by the Governor was the recommendation that there be no tax remission bills, and that the poll tax be abandoned. He also recommended that ad valorem taxes be abolished, and part of the income from the transaction tax bill substituted.

Plans were complete for introducing in the house companion bills to the major issues already submitted in the senate. The house, however, permitted the introduction of no bills until the Governor had delivered his message. This delayed matters, since the first portion of the message was delivered Thursday and the tax section on Friday.

Illinois Governor for Conservation

Governor Dwight H. Greene of Illinois last week proclaimed for oil conservation legislation. "One of the most vital and irreplaceable of natural resources of our state is a bounteous supply of oil," he said in an address. "This treasure must be carefully conserved. Our duty to coming generations as well as the immediate advantage of our people must be seriously and impartially considered by the general assembly. I urge that the study of the problem of regulation and conservation be continued."

The statement was the first by the new governor clearly stating his stand on an issue which was bitterly fought in two previous sessions of the Illinois legislature. The late Governor Henry Horner sought unsuccessfully to gain a regulatory law.

Arkansas May Allot More Money

The Arkansas legislature's budget committee approved a $50,800 appropriation to the State Oil & Gas Commission for each of the next two years, representing an increase of $7,800 over the annual budget for the past biennium, but $3,600 under the $54,400 requested by the commission. Provision for state participation in the expense of the Interstate Oil Compact Commission was made, with $1,500 allotted for this purpose. The budget is still to be acted upon by both branches of the legislature.

Several Colorado Bills

A legislative procedure that calls for introduction of all Colorado bills in the early days of the session results in many being introduced by title only. Among such measures making their appearance last week, details of which are yet unknown, were bills seeking to amend the law relating to oil and natural gas; to levy an excise tax on natural gas or manufactured gas and fuel oil transported into the state, and to levy an excise tax on transportation of oil and gas by pipe line.

South Dakota Bonus Proposal

Governor Harland J. Bushfield, addressing the South Dakota legislature, called attention to an appropriation of $25,000 made two years ago for a survey of the mineral and oil resources of the state. It permitted a survey of all of the central part of the state, and "as a result of that survey most of the large oil companies are leasing land and preparing to prospect for oil," the governor said. He asked another appropriation of $25,000 to continue the work.

"I think it advisable, however, to go further than that," the governor added. "Our sister state of Nebraska has already beaten us to the goal of oil production. They did it because they took a hand in bringing it to an early climax. The legislature of Nebraska offered a bonus of $25,000.00 for the first well showing a production of 50 barrels per day for 60 days. This bonus was won by an independent producer, and his success immediately brought into the state for further development many of the major oil companies. We may well emulate the state of Nebraska in thus bringing an early development of our oil resources. Our sister states of Texas, Oklahoma and Kansas have received incalculable benefit from the discovery of oil within their borders. South Dakota, also, would be the beneficiary of such a discovery when we consider the tremendous acreage of state-owned land. The discovery of oil would be the greatest

boon to the South Dakota taxpayer this generation can visualize. I therefore recommend an additional appropriation of $25,000.00 as an aid or a bonus for the first producing oil well under such limitations as your body sees fit to attach thereto.

"It is not difficult to envision South Dakota as a great oil-producing state," the governor added. "Many hard-headed geologists hold that view and they are not dreamers. South Dakota has practically no legislation pertaining to the oil industry, the production of oil or the drilling of wells. I recommend the enactment of at least a framework of necessary oil legislation in anticipation of the development of that industry within our state."

House Bill 10, introduced following the governor's message, seeks "to conserve crude petroleum, oil and natural gas; to create a state oil and gas board and to define its powers and duties; to authorize such board to promulgate rules and regulations for the enforcement of the provisions of the act and to conserve oil and gas and to provide penalties for the violation of ceratin provisions of the act."

Governor John Moses called attention of the North Dakota legislature to oil and other mineral deposits in the state, and urged that a "resources council be established . . . with authority to employ competent help, and perhaps a small appropriation to enable the state to safeguard its natural resources and to make studies leading to their future development."

In Wyoming, the Farm Bureau Federation is sounding out public sentiment for legislation to permit the state to operate its own refineries and engage in the sale of gasoline. Purpose of the campaign according to Vice President Ralph Mercer, is to gain lower gasoline prices.

"Our people have long felt that we are being exploited in the purchase of gasoline," Mercer said. "Governor Leslie A. Miller and Governor Nels H. Smith made campaign pledges to reduce the price, but to no avail. There is just one way that we can get the relief, and this is to direct the state to build its own refineries, and to sell this gas to the public."

A Michigan bill would empower cooperatives to drill for, transport and distribute natural gas.

Y. P. F. Argentina Production Gains 21 Percent in Year

Production of crude oil by the state-owned Yacimientos Petroliferos Fiscales in Argentina during 1940 amounted to 12,470,837 barrels, a gain of 2,247,530 barrels, or 21 percent, over the 10,223,307 barrels produced in 1939.

Output of private companies was somewhere around 8,020,357 barrels, based on figures of the first nine months of the year, according to the Argentine Bureau of Information.

Australian Gasoline Imports Down 15 Percent

Australian imports of gasoline during the five months ending with December were down 15 percent, when compared with imports for the corresponding period of 1939. The value of the imports, however, declined only 11 percent, due to a rise in price.

Rationing was in effect for the last two of the five months included in the calculation.

World-Wide Developments

Favorable Changes in Mexican Laws Expected in February

The long range outlook for Mexico's petroleum industry, recently brightened by inauguration of initial steps of reorganizing that industry to put it on a paying basis, was brightened again last week by widespread prediction that the Mexican Congress in February would follow President Camacho's recommendation and revise much of the radical legislation enacted during the Cardenas regime. Statutes which make it difficult for private enterprise, including oil, to operate with a feeling of safety about the future are expected to be changed.

Camacho has told the people he wants revised the general law of labor, the civil service code, the law of national education, and the law implementing Article 27 of the Mexican Constitution dealing with rights to the petroleum sub-soil.

Briefly, it is thought the president has in mind putting an end to unwarranted labor strikes and giving the government more power in settlement of disputes between labor and capital. It is also thought that he has in mind a change in the present ban on granting oil concessions to foreign interests—that such a modification might make possible an understanding between the Mexican government and the American, British and Dutch interests whose petroleum properties were expropriated by Cardenas March 18, 1938.

Meanwhile, financial circles in Mexico City are saying that El Aguila (Mexican Eagle Oil Company) may soon make some arrangement with the government which will provide for operation of the expropriated properties by the company or for settlement along the lines recently concluded between the government and the Sinclair interests.

These reports are renderd more interesting when considered in connection with those concerning the present visit of President Camacho's brother Maximo to the Duke of Windsor at Nassau, Bahamas. The visit is interpreted in some quarters as a step toward resumption of Anglo-Mexican diplomatic relations, broken off shortly after expropriation of the foreign-controlled oil properties.

Maximo Camacho was invited to Nassau by the duke. England feels she now can open negotiations for resumption of the relations without loss of prestige. As for Mexico's head, shortly after his inauguration Manuel Avila Camacho sent word to England that the sympathies of his administration were entirely with Great Britain in the war. Mexico wants to dispose of oil; England wants to obtain it.

New Argentine Refinery Starts Operating

The Y.P.F. (Yacimientos Petroliferos Fiscal), state oil company, refinery at Lujan de Cuyo, province of Mendoza, Argentine, started operating the latter part of December. The plant is 14 kilometers from Lujan and 30 kilometers from Mendoza. Capacity is 300 cubic meters of raw petroleum daily, and it is hoped annual output will amount to 94 million liters of petroleum, 13 million of tractor oil, 11 million of Diesel oil, and 35,000 tons of fuel oil.

Russia Reported Lacking New Drilling Equipment

Regardless of whether Russia currently is able to meet government-established quotas for crude oil production, the drilling branch of the oil inductry there apparently is in need of considerable new equipment.

Information developed in New York earlier in the month revealed that Russia recently obtained bids on 60 heavy drilling rigs which would cost the Soviet better than $10,000,000.

Delivery to the Russians of more than $1,000,000 worth of pumps and diesel engines made in America is being made, according to reports.

Pipe Lines

Texas Panhandle Compressor Station to Boost Milwaukee Gas

Texoma Natural Gas Company has authorized erection of an auxiliary compressor station and natural gasoline extraction plant in the Texas Panhandle to serve the Natural Gas Pipe Line Company of America's 24-inch trunk line to its Chicago-Milwaukee district markets. The projected unit will be located on the Sneed ranch, east central Moore County, and the initial booster equipment will comprise four 1250-horsepower compressors, rated at 50,000,000 cubic feet of gas daily. The plant layout will make provisions for the eventual installation of a total of 12, or more compressors. The trunk line was enlarged last summer through the addition of loops, and the gas market was materially increased by the extension of a line to Milwaukee.

Socony-Vacuum to Build 12-Mile Kansas Line

Socony-Vacuum Oil Company has announced construction plans for a 12-mile, four-inch oil pipe line to join the Roxbury pool, McPherson County, Kansas, with the Ritz-Canton pump station. White Eagle Refining Company will take the oil at its plant at August, Butler County. The line will provide the second outlet for Northeastern McPherson County. Bay Petroleum Company operates an oil line to its McPherson refinery.

Pure Oil Company Completes Cumberland Line

The Pure Oil Company has completed a 16-mile, 4-inch welded oil line from the Cumberland pool, Marshall and Bryan counties, Oklahoma, to the Armstrong station, near Durant, where crude will be transported by The Texas Pipe Line Company south. B. & M. Construction Company, Oklahoma City, was contractor.

Three 55,000-barrel storage tanks on the Cumberland farm have been completed.

Refined Products Firm; Tanker Rates Lower

The markets have continued generally firm, with the various refined products showing different degrees of stability. Lubricants have been among the oils actively sought, as evidenced by advancing prices, particularly in Western Pennsylvania. Burning oils remained in good demand, despite protracted mild weather. Heavy fuel oils continued relatively scarce, with market demand large, and prices are firm. Gasoline last week was unsteady in the Mid-Continent and the Middle West but remarkably firm on the Gulf Coast, where the cargo market was quite active, with sales involving shipments to be lifted mostly within the next six weeks. Some Gulf Coast refiners advanced their quotations on gasoline ⅛ to ¼ cent a gallon.

Although there have been reports of recent shading of gasoline prices in the Mid-Continent, the material involved was said to be off-specification.

In the Middle Western marketing region, however, all grades of gasoline were available at some refineries for ⅛ cent a gallon less than previously.

The markets are reacting about as could be expected from the current statistics on the different products.

Gasoline inventories still are comparatively large, but there has been continued success in avoiding any alarming winter build-up of stocks, and the storage now is only nominally larger than at this time last year, whereas demand is somewhat greater. At present, therefore, the industry has on hand fewer days' supply than it did a year ago. The stocks totaled 86,328,000 barrels on January 11, compared with 85,743,000 a year before. And the increment during the week ending on that date was only about 800,000 barrels, compared with approximately 1,800,000 in the corresponding week last year.

So far this winter, the weather has been definitely advantageous to the gasoline situation, having been mild enough to make unnecessary the making of any substantial surplus of motor fuel in connection with fulfilling requirements of the heating oils. Stocks of the light fuel oils remain quite ample, being now 10,000,000 barrels larger than at this time last winter, an increase that well takes care of the gain that has occurred in normal demand.

The crude oil markets have not undergone any significant change since a week ago, having remained generally steady, as production in most districts has been held strictly in line with market demand.

A general 5-cent-per-barrel advance for crude oil in western Michigan fields was posted, effective January 16, by leading buyers, including Sohio Corporation, Commonwealth and Imperial-Midwest. Advance was from $1.18 to $1.23 a barrel for Allegan, Kent, Ottawa and Van Buren grades, which combined represent approximately 15,000 barrels of daily shallow Traverse production.

Sohio Corporation also advanced price for Trenton-lime crude in Monroe County from $1.10 to $1.17 a barrel.

The advance for shallow west-side production was first since August 24, 1940, and followed a 10-cent general advance for Basin-grade crudes on January 2. At $1.23, west-side crude now has only a 1-cent margin over top Basin-grade prices, where previous to this time and since mid-1939, a 6-cent differential margin favoring shallow crude has been maintained. Total state output is approximately 40,500 barrels daily.

Tanker rates have definitely declined, as several fixtures have been made substantially below the recent highs. At the middle of the past week a "clean" boat was chartered for the Gulf-North Hatteras trade at 52 cents a barrel for gasoline, 54 cents for kerosene, and 57 cents for No. 2 fuel oil. Before the recent decline began about two weeks ago, the rates were 70, 75 and 80 cents, respectively.

All available "dirty" boats for moving heavy crude and fuel oils are in ready demand, as the markets continue to absorb relatively large quantities of the industrial grade fuels. Rates last paid for the Gulf-North of Hatteras movement were 59 cents a barrel for 30-gravity or lighter crude and 66 cents for 10-20-gravity fuel oil.

Latest weekly statistics on crude oil, the principal refined products, and refinery operations appear in an accompanying table.

Start Moving Illinois Oil to Central Michigan Refinery

First delivery of Illinois crude to the central Michigan refining market to offset declining production of Michigan fields is scheduled to start between January 20 and 25.

Leonard Pipe Line Company has contracted for a minimum of 100,000 barrels of oil, starting at rate of 2500 barrels per day, from Sohio Pipe Line Company, to be shipped via pipe line from Toledo, Ohio, to Leonard Pipe Line Company's Crystal station in Michigan. At this point, the latter company will take oil for rerouting by its own line into Alma.

Leonard Refineries, Inc., has contracted with its affiliate pipe line to take a minimum of 100,000 barrels of Illinois oil for use in its Alma plant, which has cracking facilities. The company's St. Louis plant will continue on Michigan crude.

At least two other central Michigan plants are considering the purchase of Illinois oil, with delivery presumably depending on the local supply and price situation. Neither pipe line company immediately made available cost figures on Illinois crude laid down at Alma. It was unofficially reported to be about 11 to 13 cents higher than Michigan crude at the same point. A 10-cent price increase of January 2 ma-

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1938:						
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
1939:						
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[2]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[2]3,650,000	[2]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 30	3,545,000	3,445,000	237,742,000	80,985,000	34,184,000	106,680,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[1]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 28	3,799,950	3,600,000	263,609,000	82,373,000	47,986,000	108,450,000
October 26	3,640,300	3,565,000	262,746,000	80,891,000	[1]48,893,000	108,475,000
November 9	3,584,200	3,510,000	261,631,000	[6]79,847,000	48,408,000	107,687,000
December 7	3,612,600	3,460,000	261,152,000	81,062,000	44,305,000	105,353,000
December 14	3,578,950	3,495,000	261,293,000	81,234,000	43,935,000	104,105,000
December 21	3,621,200	3,585,000	262,488,000	81,870,000	42,260,000	102,841,000
December 28, 1940	3,385,500	3,585,000	261,552,000	83,274,000	42,266,000	102,620,000
January 4, 1941	3,367,200	3,600,000	260,643,000	85,530,000	42,606,000	102,563,000
January 11, 1941	3,364,450	3,565,000	.....	86,328,000	41,094,000	102,281,000
January 11, 1940	3,592,200	[3]3,436,000	[4]238,581,000	85,743,000	31,143,000	104,572,000
Change in past year	—6.3%	+3.8%	+9.3%	+0.7%	+32.0%	—2.2%

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, January 6, 1940.
[5] Lowest since October, 1922, due to shut down of six mid-continent states. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] January, 1940, daily average.

terially benefited movement of crude from Illinois to Michigan.

Aurora Refining Company, Detroit, has been getting from 1500 to 2000 barrels a day of Illinois crude via pipe line from the same service that brings crude for Socony-Vacuum Oil Company's plant at Detroit.

Refinery nominations to the State Advisory Board for January 1 totaled 69,500 barrels a day, with 24,500 barrels of the total pegged for out-state delivery. On this basis, the independent refinery market wanted around 45,000 barrels a day from Michigan, 5000 barrels above current supply.

Crude Output Increases As Texas Produces Extra Day

United States crude oil production increased sharply in the week ended January 18 as Texas returned to a normal number of producing days per week, the nation's output having averaged 3,614,000 barrels daily.

That amount was 241,275 barrels above the production rate of the previous week, but only 23,000 in excess of market demand as estimated for January by the United States Bureau of Mines.

Texas fields were shut down only two days during the week, whereas they had been closed for three days in each of the several preceding weeks. Consequently, Texas output averaged 1,338,100 barrels daily for the new period, against 1,122,800 barrels the week before. Through the shut-down program, the state is staying well within market demand.

Wholesale Prices of Refined Products

	Range late Last week (Cents a gal.)		Changes from week Before	
REFINED GASOLINE				
Oklahoma Refineries:				
60 Octane and under	3¾	4¼	...	...
63-66 Octane	4	4½	—⅛	...
72-74 Octane	4½	5	...	...
Mid-Western Tank Car:				
60 Octane and under	3¾	4⅛	...	...
63-66 Octane	4⅛	4½	...	...
72-74 Octane	4½	5	...	...
New York Harbor:				
68-70 Octane	5½	5½	...	...
72-74 Octane	5½	6⅝	...	...
Gulf Coast:				
60 Octane unleaded	3½	4	+¼	...
65 Octane unleaded	3⅝	4⅛	+¼	+⅜
72-74 Octane leaded	3¾	4¼	+¼	...
NATURAL GASOLINE				
Grade 26-70:				
F.O.B. Group 3	2⅜	2⅜	...	...
F.O.B. Breckenridge, Tex.	2	2	...	...
KEROSENE				
Oklahoma Refineries:				
41-43 water white	4	4¼	...	+⅛
42-44 water white	4⅛	4⅜	...	...
Mid-Western Tank Car:				
41-43 water white	4⅛	4¼	+⅛	+⅛
42-44 water white	4¼	4⅜	+⅛	...
New York Harbor	5½	5½	...	...
RANGE OIL				
At Oklahoma Refineries	4	4⅛	...	...
In Mid-Western Market, Group 3, basis	3⅞	4	...	...
LIGHT FUEL OILS				
Oklahoma Refineries:				
No. 1 straw	3½	3⅞	...	...
No. 3	3⅜	3½	...	...
Mid-Western Tank Car:				
No. 1 white	3⅞	4	+⅛	...
No. 3	3¼	3½	...	...
New York Harbor:				
No. 1	5½	5½	...	...
No. 3	4⅞	4⅞	...	...

	Range late Last week (Per Bbl.)		Changes from week Before	
HEAVY FUEL OILS				
Oklahoma Refineries:				
No. 6	$0.65	$0.65	...	...
Mid-Western Tank Car:				
No. 5	.75	.85	...	...
No. 6	.55	.60	...	...
New York Harbor:				
No. 5	1.45	1.55	...	...
No. 6	1.25	1.25	...	...
BUNKER C FUEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$ .80	$ .85	...	—.05
New York Harbor	1.25	1.25	...	...
DIESEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$1.50	$1.70	...	...
New York Harbor	2.00	2.00	...	...
Los Angeles Basin, 27 gravity	1.20	1.26	...	—.09
LUBRICATING OIL (Cents a gal.)				
Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	12	15½	...	...
Neutral oil, pale No. 3 color, 150 viscosity at 100°, 0-10 pour test	8	10¼	...	...
Western Pennsylvania:				
Bright Stock, 145-155 viscosity at 210°, 25 pour test	13	14	+1	+1
Neutral Oil No. 3 color, 150 viscosity at 70°, 25 pour test	19	20	...	...

California production rose 7300 barrels to 619,700 daily in the week of January 18, and was about 25,000 barrels above indicated demand.

Kansas output increased 10,200 barrels to 199,200 daily, and was 8200 above demand.

Oklahoma, Illinois, Louisiana and New Mexico showed only nominal changes.

Production Jumps Slightly Above Demand

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (January)	State Allowable (Barrels Daily in January)	BARRELS DAILY FOR WEEK ENDED Jan. 11	Jan. 18
TEXAS—				
Texas Panhandle	.....	.....	72,100	71,800
North Texas	.....	.....	92,000	106,900
West Central Texas	.....	.....	29,500	30,700
West Texas	.....	.....	175,600	224,200
East Central Texas	.....	.....	74,900	83,600
East Texas Field	.....	.....	301,500	375,400
South Texas	.....	.....	164,200	196,700
Texas Gulf Coast	.....	.....	213,000	248,800
Total Texas	1,297,500	1,370,000*	1,122,800	1,338,100
CALIFORNIA—				
Long Beach	.....	.....	40,800	41,500
Midway-Sunset	.....	.....	50,400	50,800
Kettleman Hills	.....	.....	37,500	39,300
Wilmington	.....	.....	80,300	81,300
Others	.....	.....	403,400	406,800
Total California	594,800	571,000†	612,400	619,700
OKLAHOMA—				
Oklahoma City	.....	.....	84,750	86,600
Seminole Area	.....	.....	100,400	100,600
Others	.....	.....	203,125	201,350
Total Oklahoma	439,000	390,000	388,275	388,550
ILLINOIS—				
Salem	.....	.....	113,300	112,500
Louden	.....	.....	69,500	69,400
Centralia	.....	.....	14,200	13,900
Other New Pools	.....	.....	118,800	129,500
Old Pools	.....	.....	10,200	10,800
Total Illinois	363,600	.....	326,000	327,100

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (January)	State Allowable (Barrels Daily in January)	BARRELS DAILY FOR WEEK ENDED Jan. 11	Jan. 18
LOUISIANA—				
North Louisiana	.....	.....	68,800	68,700
South Louisiana	.....	.....	224,500	223,200
Total Louisiana	280,300	292,756	293,300	291,900
KANSAS	191,000	194,000	189,000	199,200
NEW MEXICO	100,000	104,000	101,500	101,200
EASTERN STATES—				
Pennsylvania Grade	48,000	.....	73,500	70,300
Others, Eastern	47,800	.....	20,700	20,500
Total Eastern States	95,800	.....	94,200	90,800
MOUNTAIN STATES—				
Wyoming	73,900	.....	75,200	76,800
Montana	19,000	.....	18,100	18,200
Colorado	3,900	.....	3,500	3,800
Total Mountain States	96,800	.....	96,800	98,800
MICHIGAN	46,100	41,000‡	42,100	41,000
ARKANSAS	66,100	70,666	69,500	69,500
INDIANA	20,000	.....	19,800	18,500
MISSISSIPPI	15,200	.....	14,800	17,000
NEBRASKA	2,000	.....	2,250	2,650
§Total 8 Prorated States	3,021,900	3,033,422	2,818,875	3,049,150
Total United States	3,591,000	.....	3,372,725	3,614,000

* Estimated net basic daily allowables as of January 1. Railroad Commission estimates that actual production normally is about 3 percent under the allowable. But allowable normally increases as new wells are completed. Under December-January order, most Texas fields were ordered shut down January 1, 4, 5, 8, 11, 12, 18, 19, 25, 26.

† Recommendation of Conservation Committee of California Oil Producers.

‡ Estimate of actual production under prescribed regulations, which do not fix a definite state total allowable.

§ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.

U. S. FIELD OPERATIONS

Illinois

Trenton-Lime Campaign Starts In Marion County, Salem Field

The drilling boom oil men have anticipated for six months is under way in the Lake Centralia-Salem pool of Marion County where Paul Rossi is completing a discovery Trenton lime producer, Brooks 8, NE SW 29-2n-2e, being put on pump after swabbing at the rate of between 8 and 12 barrels an hour following a 5000-gallon acid treatment. At an elevation of 540 feet, Brooks 8 was deepened from the Devonian at 3438 feet to 4616 feet, casing was set at 4515 feet and Trenton top was 4509 feet. Before acidization, the well flowed by heads.

Although it seems evident that the well's initial production will be far less than that of many Devonian producers which rocketed the field's output a year ago, operators are confident the Trenton will be long-lived. At least 13 other Trenton tests have started, although Rossi's venture is not a completion. The Texas Company was deepening seven former Devonian producers, Magnolia Petroleum Company was deepening five, and W. C. McBride, Inc., one. All of the tests are in Section 29-2n-2e excepting The Texas Company's Tate 21, NW 5-1n-2e, in the southern part of the field, which was drilled below 4300 feet several months ago and then plugged back for completion in Devonian without exploring the Trenton. Deepest drilling test was Magnolia Petroleum Company's Shanafelt 32, SE SW 29-2n-2e, down 4190 feet.

A new pool also was opened in Marion County with near completion of Obering & Phillips' Thalman Heirs 1, a mile and a half east of the Patoka pool, NW 35-4n-1e, which swabbed 56 barrels of oil in 24 hours from Cypress sand, total depth 1363½ feet. The well was being put on pump and has not been shot.

Tide Water Associated Oil Company perforated casing at its prospective Edwards County pool opener, Gawthorp 1, NE NE NE 13-1s-10e, to test a McClosky show at 3266-86 feet. At an elevation of 525 feet, Gawthorp 1 topped Glen Dean at 2665 feet, Benoist 3060 feet, St. Genevieve at 3206 feet. On a 90-minute drill-stem test, it showed 540 feet of oil but also had 90 feet of sulphur water. It is several miles from production.

Benton Strike Appears Important

Discovery well of the Benton pool, Franklin County, pumped 496 barrels in 22 hours for its best production to date. It is E. S. Adkins' Orient Coal Company 1, NE SW SE 24-6s-2e, producing from Tar Springs sand at 2120-2148 feet following a 15-quart shot. Adkins' Orient 1-B, four miles south of the discovery, SE NE NW 12-7s-2e, was to set a new cement job. When plug was drilled to test Tar Springs saturation at 2052 feet, water and mud broke into the hole. First Benton townsite test, just inside the south city limits, H. H. Wegener's Orient 1, was due to resume drilling after casing was cemented through a mine tunnel. Total depth was about 750 feet. Borden Oil and Gas Company was rigging up for another townsite test, Franklin Coal Company 1, SW NE NW 20-6s-3e. In the opinion of many observers, the Benton strike will rank as one of Illinois' major oil developments this year.

A townsite drilling boom also may have been presaged by Shell Oil Company's Risley 1, near Mt. Carmel, SW 17-1s-12w, Wabash County, which flowed 205 barrels in 3 hours from McClosky lime at 2349-59 feet. Total depth is 2360 feet. Glen Dean was topped at 1807 feet, and Cypress at 2040-54 feet carried no shows. The Mt. Carmel city council has granted a drilling permit for a townsite test to Eugene Jordan and F. C. Hall, Oklahoma City operators, who will drill on a 4½-acre tract on the north edge of the city. E. O. Olds is the contractor.

Plug was to be drilled late in the week at a Williamson County wildcat, Scott et al's Throckmorton 1, NE SE NW 29-10s-2e, which cemented casing several days ago to test a show in the Rosiclare. The well was drilled to 2029 feet, and then plugged back to 1916 feet. Other Williamson County developments included leasing of Herrin's city reservoir, 240 acres, to Joyce Margrave. The lease carries a 90-day drilling commitment.

A show of oil was reported at a White County wildcat, Mabee Drilling Company's W. L. Knight 1, SW SW SE 10-7s-9e, reported to have found oil in the Tar Springs. However, the well was being deepened in the Aux Vases at about 2950 feet. About six feet of saturation in the Cypress at 2617-23 feet is said to have carried water and the Benoist was reported dry. Regardless of whether the test is successfully completed, it is probable other exploration will be undertaken in the area soon.

Exchange Oil Company's offset to a Hamilton County discovery well, Etta Silliman 1, NW NW 34-3s-5e, was drilling below 2750 feet. The discovery, Dick Duncan's holding, was completed in McClosky lime and has been on production since the first of the year.

Magnolia Petroleum Company's deep wildcat in Jackson County, Smith Heirs 1, NE 9-8s-3w, was drilling at 3797 feet in Trenton lime, and as yet has found no shows. A company representative said "it looks like a dry hole," but indicated the well may be carried on to the St. Peter sand.

Benedum-Trees Oil Company was starting a rank wildcat in the extreme southern part of the state, Cavitt 1, SW SW NW 24-11s-3e, in about the center of a 5100-acre block assembled by James Monroe. It is about five miles southwest of L. V. Garnier's Peeples 1, Pope County wildcat which was testing the McClosky.

An important Marion County wildcat, Absher & Booth's Hoffman 1, NW NW NW 31-4n-3e, located on or near the much discussed "Kinmundy structure," was drilling below surface pipe, set at 60 feet.

Prospects of additional production in the new McKinley pool, Washington County, were brightened when Joe Murphy announced he would set casing at Baumeyer 1, SW NE 29-3e-4w, two locations east of the pool's discovery well and only producer, DeKalb Agricultural Association's Hunleth 3, making 150 barrels daily from Benoist sand. Murphy's test was shut down for some time after failing to find Benoist sand at the anticipated depth, but was deepened and cored saturation at 1039-44½ feet. Since completion of the discovery, the area has been blighted by two dry holes, drilled by DeKalb and W. C. McBride, Inc.

Indiana

Attempt to Extend Illinois Pool into Posey County

The recently opened Golden pool of eastern White County, Illinois, two miles south of Ribeyre Island, may be extended across the Wabash River into Posey County, Indiana. About ¾ mile south of the pool's Waltersburg-sand discovery, A. L. Cochran et al's Hattie Golden 1, Harry Appell and Charles Jones located McFadden Upper Island 1, on a 47.5-acre Indiana lease in the Wabash River, NE SE NE 32-5s-14w. Contract had not been let. Five miles east of the new discovery, Carter Oil Company was drilling before surface casing in Edward Highman 1, SW SE SW 31-5s-13w, Posey County wildcat in Lynn Township. Manahan Drilling Company is contractor.

A northeast outpost to the Heusler Dome field of Marrs Township, Posey County, Harris-Stuart's Weldon-Strueh (Reis) 2, SE SE NE 1-7s-12w, set casing to test six feet of Waltersburg-sand saturation topped at 1716 feet. Starting at surface elevation of 387 feet, the test is reported to run low, structurally. Tests to the east, into Vanderburgh County, carried water in the Waltersburg.

In southern Point Township, Posey County, north of Neiderst, Basin Drilling Company and North Central Oil Company's Oakland City College 1, NE NE NE SW 16-8s-14w, Sun Oil Company farm-out, was waiting on cement with casing set at 2522 feet, about 30

feet above the expected Aux Vases-sand pay. Hole will be deepened and completed with cable tools.

In the Rockport field of Spencer County, permit was granted for the Kentucky Natural Gas Company's Heber Scamahorn 3, NE NW 29-7s-6w. Staves Drilling Company, Owensboro, is contractor.

Disappointing was the latest test to be drilled in the St. Thomas pool of Knox County, south of Vincennes, Midwest Development Company's I. Ward Frey 1, NE SW NW 13-2n-11w. Drillstem test was being made of very slight saturation at 1891 feet. Hole was bottomed at 1920 feet. The test is about ¾ mile north of W. C. McBride, Inc.'s Metropolitan Life Insurance Company 1, McClosky producer.

Kentucky

Rig for Ordovician Age Wildcat in Graves County

Cable tools were being rigged for a 2200-foot Ordovician-age wildcat in Graves County, 33 miles southeast of Paducah, on the east edge of the town of Farmington, Hank Riddle and John McKeel's Adir 1. Jack Cox, Owensboro, is contractor.

In McLean County, two miles southwest of Livermore, James C. Ellis' Stevens Heirs 4, Section 6-L-29, was completed in the McClosky for an initial of 550 barrels daily after acid. Hole was bottomed at 1678 feet.

In Muhlenberg County, a mile south of Bremen, Peerless Oil Company was drilling at about 1000 feet for E. Noftsinfer 1, wildcat in Section 18-K-28.

Texas Comissioner Praises Oklahoma-Kansas Change

Commenting on a recent revision in purchasing practices in Oklahoma and Kansas, by which The Texas Company is buying oil on 100 percent tank tables, Railroad Commissioner Thompson last week issued the following statement:

"I noticed in the press yesterday that in the states of Oklahoma and Kansas, The Texas Company has decided to pay for oil on the 100 percent table. The old custom has been for many years to pay only 97 percent.

"I am happy to see these states finally getting paid for their oil on a 100 percent basis.

"It is interesting to note that Texas led off in this six years ago. Prior to that time, the oil companies paid on a basis of 97 percent. In other words, if a man sold 100 barrels of oil, he got paid for 97 barrels of oil. But about six years ago, the Texas Railroad Commission, by use of orders which were successfully defended, required payment on a 100 percent basis. This has meant through the years about $15,000,000.00 extra to the oil producers of Texas.

"I am glad to see Oklahoma and Kansas producers are now getting what Texas producers are getting. This $15,000,000.00 a year extra to Texas producers in the past six years amounts to about $90,000,000.00, extra. No small accomplishment."

Kansas

Small Extensions Given Gorham and Midway Pools

Hayes & Anchutz extended Gorham pool, Russell County, ½-mile south at Ball 1, NEc NW 16-14-15w, which swabbed 73 barrels in 24 hours after treating Topeka lime at 2792 feet with acid. Sam Schneider moved Midway pool, Rice County, 5/8-mile northwest at Miller 2, SWc NE 9-20-9w, which filled 1800 feet with oil in 24 hours after drilling plugs in Arbuckle lime at 3226-56 feet.

Braden & McClure et al's Phillip 1, C N½ NW SE 34-15-11w, discovery 1¼ miles northeast of Davidson pool, Russell County, established a pumping potential of 1250 barrels per dav. Before treating with 2000 gallons of acid, this wildcat made a temporary potential of 96 barrels in two hours by swab. Pay is Gorham sand at 3307-13 feet.

Wildcat failures during the past week were plentiful. In Republic County, Northern Kansas, Wilcox Oil & Gas Company abandoned Hirman 1, C SE NW 30-2s-1w, at 3565 feet in Arbuckle lime. This wildcat was located 7 miles east of Belleville. Log showed Topeka lime topped at 1817 feet, Lansing 2050 feet, Mississippi 2680 feet and Arbuckle at 3554 feet.

Derby Oil Company and E. K. Carey Drilling Company plugged Weimeister 1, C W½ NW NE 24-14-14w, a mile east of Hall pool, Russell County. Aladdin Petroleum Corporation et al's Macklin 1, C NW NW 26-18-1w, North Canton area, McPherson County, was plugged in Mississippi Chat at 2820-70 feet.

British-American Oil Producing Company and Crown Petroleum Corporation et al's Linder 1, NEc SW 24-17-14w, three miles southwest of Hoisington pool, Barton County, topped Topeka lime at 2890 feet, Lansing-Kansas City lime 3212 feet, Conglomerate 3400 feet, and was drilling below 3450 feet without a show.

Atlantic Refining Company and Skelly Oil Company plugged Wratil 1, C E½ SE NW 15-22-15w, 6 miles southeast of Larned, Pawnee County, at 4009 feet in Arbuckle lime, topped at 3986 feet.

Three miles north of Jordan pool and six miles southwest of St. John pool, Stafford County, Bay Petroleum Company et al abandoned Campbell 1, C E½ NE NE 33-24-15w, at 4570 feet in Arbuckle lime. Anhydrite was topped at 1015 feet, Lansing 3771 feet, Conglomerate 4130 feet, Simpson 4445 feet and Arbuckle lime at 4516 feet. Cores to 4528 feet were dry.

Gulf Oil Corporation had rig at Rome 1, C W½ SW SW 19-13-16w, 1¼ miles south of south end of Trapp pool, Barton County. Central Petroleum Company has taken a Gulf Oil Corporation farm-out and staked location for Lemon 1, C SW NE 16-15-12w, 1½ miles south of Greenvale pool, Russell County. Claude Drilling Company, Tulsa, have contract, while Shell Oil Company is supporting.

Central Petroleum Company was drilling Hogan 1, C N½ NE SE 34-16-13w, semi-wildcat in the Ainsworth area, Barton County.

In Butler County, L. D. Davidson had cellar and pits at Burnham 1, C E½ SE SE 2-28-7e, southeast of Keighley pool. In Finney County, Kansas Power & Light Company staked Spratt 1, c 31-24-33w, north edge of Holcomb gas pool which straddles Finney and Kearny counties.

S. Huffman et al's Morton 1, NE SE NE 10-28-12e, Greenwood County, has spudded. W. L. Hartman et al's Dresback 1, C E½ SE NE 7-21-6w, northeast of Wherry pool, Rice County, was drilling below 3000 feet. Stevens County Oil & Gas Company was drilling below 1750 feet at Kuhn 1, SE SEc NE 34-31-39w, a wildcat in the Hugoton gas area of Stevens County. Same firm staked location for Smith 1, SW SWC SE 25-31-39w, in the pool.

Oklahoma

Okfuskee County Wildcat Provides Large Gas Well

Deep Rock Oil Corporation's Davis 1, SW SE NE 20-11n-9e, a wildcat three miles northeast of East Cromwell pool and 4 miles southeast of Dill pool, Okfuskee County, perforated Hunton lime with 40 shots at 3912-60 feet and acidized with 2000 gallons to obtain open-flow gauge of 58,250,000 feet, of gas per day, with rock pressure of 1500 pounds. Before acidizing, it gauged 12,000,000 feet per day. Oklahoma Natural Gas Company will connect with the well. This wildcat was started by Fred Coogan, Sayre, who was ready to abandon after finding Wilcox sand dry at 4105-47 feet. Deep Rock Oil Corporation took over on basis of shows revealed by electric log, which disclosed Oswego lime at 1410 feet, Calvin 1443 feet, Brown lime 2820 feet, Booch sand zone 2990 feet, Gilcrease 3138 feet with a small show of oil. Cromwell sand was absent, with a stray sand at 3376-80 feet. Caney was topped at 3393 feet, Mayes 3727 feet, Woodford 3858 feet, Hunton 3871 feet, Sylvan 3986 feet, Viola 4050 feet, Dense 4068 feet and Dolomite at 4073 feet. Location is on a spread of 900 acres with Deep Rock Oil Corporation controlling 200 acres. Offset drilling obligations are held by Earl Davis, Wewoka, Exchange Drilling Company, Fred Coogan, Sayre, and a diagonal offset by Fain Drilling Company. East offset acreage is held by Skelly Oil Company, while Exchange Drilling Company has south and west offsets.

W. A. Delaney, Jr. and Atlantic Refining Company may have a Wilcox-sand discovery at Clark 1, NEc SE 30-8n-7e, northeast of Little River pool, Seminole County. With packer set at 4238 feet, a drill-stem test recovered 200 feet of oil, 70 feet of oily mud and a small amount of fresh water. Hole is bottomed at 4291 feet in Wilcox sand, topped at 4272 feet. Operators cemented 7-inch casing at 4282 feet, and will drill plugs for further testing.

Kerlyn Oil Company's Cherry 1, SE NE NW 32-8n-5e, wildcat northeast of St. Louis pool and south of Maud pool, Pottawatomie County, filled 3500 feet of oil after plugs were drilled in Simpson dolomite at 4290-4325 feet. Swab line broke

while taking a production test, and operators were fishing. In two hours, 200 barrels was tanked.

Indian Territory Illuminating Oil Company added two producers in West Frederick pool, Tillman County, to extend that area. Banker 1, C E½ NE 2-3s-19w, flowed 1729 barrels in 24 hours from pay in Arbuckle lime, topped at 5071 feet and penetrated to 5103 feet. Zeller 2, C S½ SW 36-2s-19w, pumped 141 barrels of oil and 900 barrels of water on completion test in Arbuckle lime at 5107-77 feet.

In Jefferson County, just across the Red River, Hampton-Stelley and King Oil Company, Wichita Falls, staked location for Pealor 1, C NW NE NW 33-7s-6w, for a 6500-foot test. It is located in the Fleetwood townsite, 6 miles southwest of Seay pool. W. R. Dillard moved in materials at Osage 1, SW NE NW 32-21n-9e, northeast of Lauderdale district.

Grisso Royalty Company and Eason Oil Company staked location for Rayster 1, SW NW NW 33-6n-3e, north of Byars pool and southwest of West Asher pool, Pottawatomie County. Same firms are deepening La Reau 1, NEc SW 33-6n-3e, wildcat test which topped Hunton lime at 3600 feet, Sylvan 3750 feet, Viola 3881 feet, with dead oil stain recovered. Dolomite was logged at 4068 feet, with dry core at 3618-24 feet. At 3624-29 feet, core barrel showed four feet and three inches with one foot of bleeding lime in spots, and remainder hard lime. A drill-stem test open 45 minutes at 3603½-3781 feet gave no recovery. Hole was being deepened below 4170 feet.

In Logan County, Fain Drilling Company and Hamilton are drilling at Donoghue 1, C NW SE 7-17n-1w, 4 miles west of Langston pool, Logan County.

Willis Anderson spudded and shut down at Percell 1, C NW SE 9-13n-26w, west of Rankin, Roger Mills County, Western Oklahoma Basin.

Gulf Oil Corporation's Hess 1, C NE NW 33-23n-13w, wildcat southeast of Galena, Woods County, had stuck drill pipe at 8178 feet in lime. Kinderhook shale was topped at 7540 feet, Woodford shale at 7720 feet and Hunton lime was logged at 7726 feet. Over 1000 feet of Mississippi lime was penetrated to structurally lower the position. Same operator's Krieger 1, C E½ NE SW 3-2n-5w, deep test in the Velma pool, Stephens County, topped sand at 2570 feet and cored at 2573-82 feet for a 5-foot recovery of shaley sand showing some oil. Bit was drilling below 4495 feet in sandy shale, with nothing showing. It is a scheduled Arbuckle-lime test.

Magnolia Petroleum Company's McKoy Heirs 1, SWc SE 16-5n-11e, east of Calvin pool, Hughes County, cut Lower Cromwell sand at 5492-5568 feet, and was coring below 6450 feet with gas coming from up the hole.

Second Wilcox sand at 7127-35 feet was dry at I. T. I. O. Company's Cronkite 1, NEc NW 22-15n-4w, 5 miles west of Seward pool, Logan County.

Shell Oil Company perforated Davis 1, SWc 18-13n-9e, at 3940-66 feet in Hunton lime and acidized with 1000 gallons, but swabbed ¼ barrel of water per hour for 7 hours. Electric log showed favorable at this zone. Previously this wildcat, south of Welty, Okfuskee County, swabbed 16 barrels of 29-gravity oil and 81 barrels of water in 24 hours from Wilcox sand at 4107-17 feet. Pay was squibbed with 10 quarts.

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Forest City Basin

Cass County Test Cores Wilcox-Sand Saturation

Golden Rod Oil Company may open a third pool for Nebraska at Sporrer 1, SEc 8-11n-13e, 8 miles southwest of Plattsmouth, Cass County, and 14 miles south of Omaha. Wilcox sand was topped at 1330 feet and saturation cored 3 feet lower. State Geologist E. C. Reed inspected the cores and reported good oil content, but probably not commercial. Operators deepened to 1355 feet, and pulled a more saturated core. This wildcat was started more than 2 years ago. Small oil shows were logged in the Bartlesville zone at 390 feet. Mississippi lime was topped at 400 feet, Viola at 1020 feet, and 5-inch casing cemented at 1018 feet.

Eight miles northwest of Sporrer 1, and across the line in Sarpy County, L. H. Hough et al's Timm 1, C S½ SW SE 15-13n-12e, was waiting on 10-inch casing at 350 feet. Mississippi lime was topped at 235 feet, Kinderhook at 312 feet with a small show of oil and gas logged at 335 feet.

In Otoe County, Charles G. Zimmer, Nebraska City, staked location for a wildcat test in Section 31-9n-14e, east of the Nemaha granite ridge. Drilling contract was awarded Frank Phelpa, McPherson. Location is 3 miles northwest of Nebraska City.

Two new completions were recorded in Falls City pool, while one test was abandoned. E. J. Shaffer's Sandrock 2, NE NW SW 20-1n-16e, pumped 100 barrels of oil and the same quantity of water in 24 hours after treating Hunton lime at 2249-67 feet with 500 gallons of butane and 1000 gallons of acid. Skelly Oil Company pumped 50 barrels of oil and 50 barrels of water in 24 hours from Davidson 3, SE NW NE 20-1n-16e. Pay was logged at 2242-68 feet and treated with 1000 gallons of acid. E. J. Shaffer et al failed to find commercial production in Viola lime at Sandrock 1, NE SW NW 20-1n-16e, at 2873 feet. Hole was plugged to 2303 feet, and casing perforated in Hunton lime, topped at 2230 feet. In 24 hours, pump potential rated 150 barrels of oil with 400 barrels of water. Same operators' Sandrock 3, NW SW NW 20-1n-16e, defined west-side production in Falls City pool, being plugged in Hunton lime at 2260-2270½ feet. Hole filled 600 feet with water and a trace of oil.

J. & M. Oil Company staked Bugner 1, NE SE NE 31-1n-16e, 1½ miles southwest of Falls City pool, Richardson County. Cellar and pits have been completed.

The Ohio Oil Company's Sandrock 6, SW NW NE SE 20-1n-16e, is rotating below 2000 feet and nearing Hunton production.

East Texas

Hawkins Dry Hole Appears to Define Northeast Production

Completion of a Woodbine failure, Edgar C. Johnston et al's Green 1, J. P. Mosely Survey, three miles northeast of nearest production in the townsite section of the Hawkins dome, provides the third control point in tentatively outlining the productive limits of the most recent oil strike in the East Texas basin. The discovery pumper, 3-1/3 miles northeast of the town, and an old failure in Woodbine at 5135-5330 feet, two miles southeast of Hawkins, delimit production in their respective directions. This trio of key tests roughly form a triangle, leaving the west and southwest trends open for major expansion of the productive area.

The Green test was awaiting orders in Woodbine water sand at 4835 feet, with an elevation of 366 feet. Electrical survey listed the following geological markers: top Nacatoch 2413 feet; top Pecan Gap chalk 3196 feet; Austin chalk 4456-4540 feet; sub-Clarksville sand 4540-53 feet, and Woodbine series 4773 feet. The latter marker is 35 feet lower than the discovery pumper, and 466 feet lower than the nearest townsite well.

Occupying the high structural position of the three completed oil wells on the Hawkins dome, Hollingsworth Drilling Company and B. B. Orr's Robbins 1, northeast extension for the townsite sector, flowed 185 barrels of oil through 1/16-inch choke on six-hour official gauge. This producer drilled through the known Woodbine oil sand to 4803 feet, with an elevation of 441 feet, and cemented 5½-inch pipe at 4795 feet. Production is from perforations opposite the best oil-saturated sand zones at 4749-67, 4730-35 and 4686-4727 feet. Top of Woodbine series was placed between 4390-4405 feet. First gas was logged by sample at 4469 feet, and top of oil sand at 4568 feet.

The drilling of a relief well offsetting Bobby Manziel et al's Lee Bell 1, junked gasser in the Sub-Clarksville sand at 4363 feet, was under way late last week upon orders of the Texas Railroad Commission. The troublesome gas well blew out December 29, and was out of control for a week. The situation was believed remedied by cementing the lost section of drill pipe in the hole on two trys. Crater began forming January 14 around the supposedly killed gasser, and it became necessary to topple the steel derrick with stands of drill pipe to prevent the loss of same by sinking.

The underground gas flow is reaching the Nacatoch water sand near the 2300-foot level, then spreading to other leases. It is believed responsible for the appearance of gas around the surface pipe of Rotundi-Jackson et al's Cobb 1, first oil well for the Hawkins townsite and a mile from the junked gasser. The Cobb well was killed early last week as a precautionary measure on orders issued by the commission, as it was drilled with 100 feet of surface pipe and the customery oil string, and is not prepared to cope with a blowout from the Nacatoch sand. Tests started after the simultaneous completion of Cobb 1 and the blowout at Bell 1 have cemented 1200-foot string of surface pipe on commission orders.

Humble Oil & Refining Company, largest owner of acreage in the Hawkins field, moved in rigs for the drilling of 2 tests, including Cliff 1, an east offset to Bob Manziel et al's Morrison 1, discovery pumper and 3½ miles northwest of the townsite production. The other location was assigned to the northwest corner of the E. W. Moore 66½-acre tract, being a mile southeast of the discovery and on a direct strike with the townsite. Moore 1 is near the center of the company's holdings.

Confirmation of high structural position occupied by R. H. & W. Oil Company's Saunders 1, northeastern Anderson County wildcat in the Frankston townsite, was given by electrical formation survey made before cementing protection string of 7-inch pipe at 4960 feet, or eight feet off bottom.

This prospect logged Pecan Gap chalk at 3450-3780 feet, Austin chalk at 4605-4835 feet, and sub-Clarksville sand, carrying water, at 4878-4905 feet, with an elevation of 431 feet. No date has been set for drilling plugs and deepening to the Woodbine. J. W. Luttes et al's McKee 1, Walter F. Pool Survey, 3 miles southeast, logged Pecan chalk at 3830-4390 feet, with an elevation of 391 feet, and was abandoned in July, 1935, at 4511 feet.

Installation of field gathering system and direct pipe-line outlet for the Hawkins area is getting under way. Humble Pipe Line Company authorized the project recently and will lay a 5½-mile 6-inch discharge line from the townsite sector south into Smith County where connection will be made with its Van-Shreveport 93-mile 10-inch carrier. The latter comprises two 10-inch lines extending east from Longview Junction, Gregg County, receiving point for approximately 12,000 barrels of low-gravity oil daily from the Talco field. Van field shipments have been negligible in recent years, making it possible to utilize the entire 40,000 barrels daily capacity of the unit nearest Hawkins. All Van and Talco oil receipts have been consigned to Standard Oil Company of Louisiana's Baton Rouge plant owing to their low gravity and sulphur content. Hawkins oil is an intermediate grade, averaging 29 gravity and has 2 percent sulphur content, so it is also due to be delivered to the Louisiana refinery.

Across the River

Drilling was resumed last midweek by William Goldston et al's Osborn-Sun 1, northeast corner of H. S. Cobb Survey, after cementing 10-inch surface pipe at 1203 feet, with an elevation of 317 feet. This test is 6500 feet south of the nearest townsite producer, and 7000 feet west of a 5330-foot failure. It probably will determine whether Smith County will share in the production as it is on the north bank of the Sabine River, which separates Wood and Smith counties.

Derrick has been erected for Red Iron Drilling Company and A. A. Folsom's Prince 1, located on a 10-acre lease, Edwin Wideman Survey, 2000 feet southwest of the junked gasser. Actual drilling may be deferred until the gas menace is eliminated.

Negotiations are under way for the financing of numerous tests by inde-

pendent owners of small leases and town lots through oil payments along the line followed successfully in the East Texas field. Drilling contractors are entering the picture by contracting to drill tests in return for lease interests.

The Ore City prospect, northeastern Upshur County, and overlapping into Harrison and Marion counties, is to be given an 8000-foot test immediately by Sun Oil Company on lease farmed out by Republican Production Company. Sun Oil Company holds lease on a large block of acreage that will soon lapse, and will seek production primarily from the Trinity series as the area has been partially explored for Woodbine.

Gulf Oil Corporation's Venters 1, west offset to the Pittsburgh pool, Camp County discovery well, halted at 8107 feet in Travis Peak sandstone to run electrical formation survey to determine casing seat. Drill-stem test at 7939-8050 feet yielded 990 feet of oil-cut mud, and second test at 8046-94 feet showed 450 feet of drilling fluid. Sands that correspond with the producing zone at the discovery were logged at 7936-64 feet and 7990-8047 feet, but comparatively little gas is present.

North Texas

Bend-Lime Pool Indicated by Young County Wildcat Test

Discovery of a Bend-lime pool in Young County, a mile east of New Castle, is indicated by R. P. Dorian and Mitchell's Grigsby 1, NWC TE&L Section 416, which was awaiting spudder to drill plugs and test. Fifteen-foot section of saturated lime was logged in drilling to 3989 feet. Seven-inch pipe is cemented at 3974 feet. Previous tests in the general area gave promise of commercial production, and in 1925 Whitehead et al's Belknap 1, ¾-mile southwest, flowed oil by heads at 3980-90 feet.

A new depth record for North Texas will likely be established this week by Amon Carter et al's Allen 1, Denton County wildcat, drilling at 8150 feet, with announced plans to continue to the 10,000-foot level, if necessary, to reach the Ordovician series. The district's depth record has remained at the 8331-foot level for five years.

Fifth Cisco-sand producer for the Fargo pool, northwestern Wilbarger County, was recorded when Amerada Petroleum Corporation's Luedtke 1, NW NE NW H&TC Section 36, flowed 513 barrels of 41-gravity oil natural through 1-inch choke in 8 hours. Production is from sand at 3207-50 feet, with the hole bottomed in shale at 3254 feet. Rig has been skidded to drill Folley 2, northeast corner of lease in the same section, and plans are to continue development of the 3-pay area in anticipation of a direct pipe line outlet. In the meantime the allowable is being produced by making tank truck deliveries to a refinery at Grandfield, Oklahoma.

Big Six Oil Company's Morris 1, recent wildcat strike for the Harrold area, northeast Wilbarger County, has failed to record steady flow when tested through various size tubing chokes from Cisco sand at 2895-2907 feet. The well flows 20 to 30 barrels hourly for short periods after being shut in. A light nitro shot is not possible, since pipe is cemented on top of the pay.

North offsets to the two Bend lime flowing wells in the Benton-Dodson pool, mile east of Nocona, encountered difficulties in trying to complete. Chapman & McFarlin's Dodson 1, offsetting the discovery, showed for a small oil yield when tested in conglomerate at 5109 feet, and has moved in spudder to clean out after using 1500 gallons of acid to try for flowing production. Stanolind Oil & Gas Company's Dodson 1-B, west offset, developed split casing at 3285 feet, thereby accounting for water that appeared in trying to complete in conglomerate at 5107-20 feet in Bend, topped at 5038 feet. Both tests recorded better oil production prospects in using formation tester in the 4500-foot Strawn than in the Bend. Phillips Petroleum Company's Dodson 1, west outpost, was drilling at 3510 feet.

Hapgood Outpost Flows

R. C. Lipscomb et al's Hapgood 1, southeast outpost for the Hapgood pool, eastern Clay County, became the third producer in registering a natural flow of 112 barrels of oil and 34 barrels of water on 8-hour gauge through 12/65-inch choke. The hole was plugged back from water at 6103 feet to conglomerate pay at 6077-86 feet. Contract has been awarded to W. B. Omohundro by M. M. Cherry, Jr., and Robert O. Smith for the drilling of a Bend test in western Clay County and 1⅛ miles southwest of the Howard one-well pool. The original location has been moved to northeast corner of the A. Haberman tract, J. T. Belcher Survey. Superior Oil Company of California, owner of a lease bolck to the south, is supporting the project with a bottom-hole contribution.

Britt Cranfill and C. E. Rodgers' McKay 1, northwestern Wise County wildcat, met depth contract in drilling to 7154 feet in Ellenburger, topped at 7005 feet. Owners plan to run liner below 7-inch casing seat at 5796 feet, and acidize nominal porosity and saturation logged in the Mississippian and Simpson, topped at 6840 feet and 6870 feet, respectively. Walter Gant et al's Laird 1, located 2¾ miles to the north and in Montague County, recovered 125 barrels of oil on 6-hour swabbing test from Strawn at 4865-73 feet after standing 10 days. It has been in process of completion since last October, having plugged back from 6651 feet.

Continental Oil Company's Robertson 1, Jack County wildcat, was drilling extremely hard Ellenburger dolomite at 5480 feet, with no increase in oil and gas since showing for a small producer at 5386 feet. Rathke Oil Company and R. C. Parker's Mosely 1, eastern Jack County wildcat, was awaiting orders at 5347 feet, with 1300 pounds pressure on casing. This test showed for a small wet gasser in Bend at 4498-4510 feet and 4745-50 feet.

Gulf Oil Corporation's Worsham-Spring 3, south edge of the Ringgold pool, Montague County, encountered additional oil pay in deepening with tools without increasing the volume of

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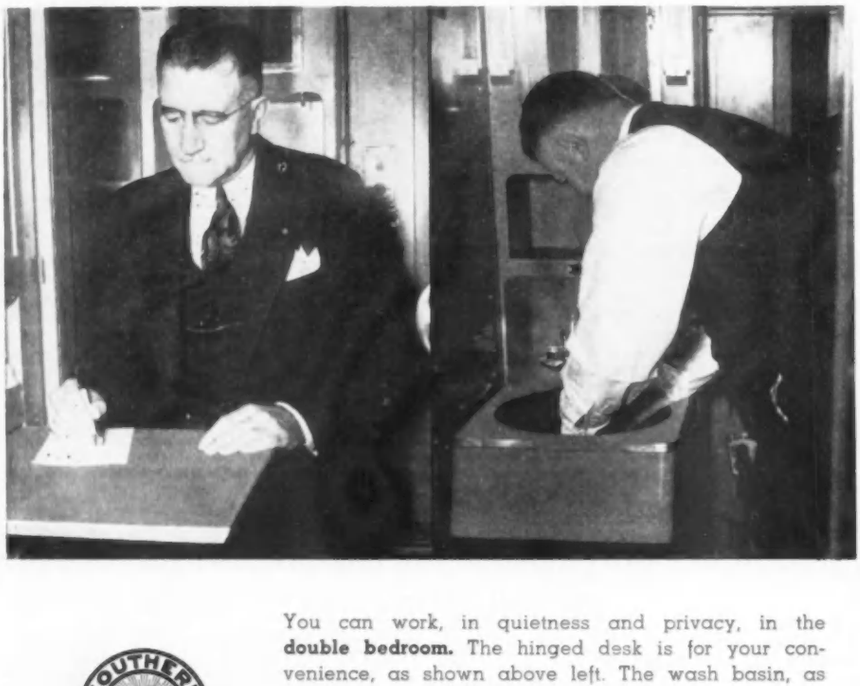

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water that appeared when completion was attempted at 5850 feet from conglomerate at 5766-82 feet and 5818-24 feet. Broken conglomerate saturation was logged in deepening to 5877 feet, where the well produced 299 barrels of oil and 24 barrels of water daily on swabbing and flowing test. The company's Worsham-Spring 4, west of production, was drilling at 4250 feet, and location for Scaling 1, NE NW NW T&NO Section 3, will try for deep production adjacent to abandoned Strawn wells in the original Worsham pool and 2½ miles southwest of the Ringgold pool. Gulf Oil Corporation and Walter Gant jointly own lease on all intermediate acreage. Gant et al's Stine 1, 1⅓ miles west of the north end of the Ringgold area, has recemented liner on bottom at 5807 feet in Ellenburger, topped at 5787 feet, after testing water. This outpost logged nominal shows of oil and gas with water in drilling the 231-foot section of Bend. Sinclair Prairie Oil Company's Hawkins 1, 2 miles southeast of Ringgold townsite, was drilling at 4415 feet. Benson & Benson's Benton 1, 2 miles southeast of Ringgold pool, abandoned after yielding water on drill-stem test in Bend at 5819-42 feet, having plugged back from Ellenburger at 5980-6213 feet.

Expansion of the Bonita dual-pay area to the northwest looms as result of Sinclair Prairie Oil Company's Gilbert 2 having logged oil saturation at 5296-5310 feet. This marker correlates only 12 feet lower than the company's prolific well in the southeast corner of the lease. The company's Doty 3, also a northwest outpost, and Howard 6 were drilling at 700 feet and 4902 feet, respectively.

United Gas Employes Complete Science Course

Certificates will be awarded to 35 employes at the Latex compressor station of United Gas Pipe Line Company, who, on January 9, ended 12 weeks of study in elementary science, an American Petroleum Institute course, according to John Woodruff, Kilgore, coordinator, Trade and Industrial Division, Texas State Department of Vocational Education.

Thirty-six men took the course, which started October 8, 1940, and consisted of 48 hours of study. N. N. Burlington, chief clerk at the compressor station, was the instructor. Guests at the last class included M. V. Cousins, personnel director of United Gas Pipe Line Company; A. L. Bradford, superintendent of compressor stations; Vernon R. Rasch, assistant personnel director, and M. M. Heller, engineering department, all of Shreveport.

The class voted to start a class in internal combustion engines, which will begin January 26 with W. A. Tabb, chief engineer, as instructor. The men are working for the API master's certificate, which is given on completion of eight recommended courses. Last year they completed two courses in elementary and advanced mathematics. Classes meet at the Latex station office.

ILIFF SPENCER HIGGINBOTHAM, engineer in the land department of Deep Rock Oil Corporation, Tulsa, and a captain in the Field Artillery Reserve Corps, has received orders to report for one year's active duty at Fort Sill, Oklahoma, on January 23.

West Texas

Soma-Noelke Shallow Pool Production Extended South

Half-mile south extension for the Soma-Noelke shallow oil and gas pool, Western Crockett County, resulted from completion of Moore Exploration Company and Olson Oil Company's W. T. Noelke-State 2, Section 77, flowing 25 barrels of 33-gravity oil on 1-hour proration test. Production is from sand lense in the Yates section at 1194-1217 feet. The prolic flow of gas encountered with oil by the majority of the wells in the pool proper was not present. A previous test drilled last summer by the partnership in the northwest portion of the 129.7-acre lease apparently missed the pay in drilling to 1518 feet, but later filled with oil, indicating a small pumper.

Continental Oil Company et al's Todd 7, west offset to the Crinoidal lime discovery of the Todd deep area, Crockett County, became the seventh producer in flowing 642 barrels of 41-gravity oil natural in 5 hours through 2-inch outlet on casing. Top of Crinoidal was called at 5570 feet, with saturation at 5575-5693 feet. E. M. Wahlenmaier and Steve Currie's Bean 1-a, 3½ miles southeast of the deep producing area, is due to run an extra string of casing, or blank liner to shutoff upper gas to test oil pay passed up in drilling to 1456 feet. This semi-wildcat produced 9,920,000 feet of sulphur gas daily when tested at 1227 feet, with pipe cemented at 1144 feet. The well makes heads of oil after being shutin for brief periods.

Wildcat Campaign

Large-scale lease buying in central and eastern Crockett County the past year by majors and substantial independents is believed to be the forerunner of an active wildcat drilling program. Some purchasers acquired short-term leases in order to fill out their blocks. This play is believed to be predicated on production possibilities of the Pennsylvanian and Ordovician series. Indian Territory Illuminating Oil Company is credited with having made location for Henderson 1, NWc SE T.C.Ry Section 33, Block ST, 14 miles southwest of Ozona. However, it is to seek production from the Permian above the 2000-foot level.

Unusually large blocks of leases are involved in some of the pending wildcat projects pending at scattered points in the district. M. L. Richards and associates recently completed an 18-section block, centering upon Northeastern Borden County and Northwestern Scurry County, and contracted to drill a 3250-foot test on the Hale ranch, SW H&TC Section 307, Block 97, Borden County. In Northwestern Ward County, J. E. Fitz-Patrick et al's Gaddie 1, south corner W&NW Section 23, Block 1, has awarded drilling contract for completion of a 5000-foot Delaware test. Surface pipe was set to meet lease requirements last November. Three companies have purchased $5,000 spreads each out of the 15¾-section lease block.

Honolulu Oil Corporation has taken up option to lease a 19,000-acre block out of the Ellwood ranch, centering upon Block A, R. M. Thompson Survey, Northeastern Hockley County. Geophysical operations were recently completed by the company, and acreage was selected accordingly on a 10-year term lease.

Two normal size producers were completed by Magnolia Petroleum Company on the north edge of the Hockley County portion of the Duggan-Slaughter field, making additional direct offsets to be drilled by independents that recently contracted to develop Mallet ranch acreage and carry the fee owner for an interest. Magnolia Petroleum Company's Mallet 4, NWc Labor 2, League 50, flowed 842 barrels potential through 1-inch choke after using acid at 4950-5011 feet, and Mallet 3-F, NEc Labor 3, League 49, flowed 25 barrels hourly through 1-inch choke following acid treatment of pay at 4940-99 feet.

Pecos Well Has Show

Culbertson & Irwin, Inc.,'s Heiner 1, Northern Pecos County Ordovician project on a strike to the south of the Pecos Valley shallow district, regained the spotlight through having encountered show of oil deeper in the Ellenburger section than ordinarily found in other deep areas, and was drilling at 5420 feet. This wildcat failed to respond to the use of acid in Ellenburger at 5128-88 feet, and when deepened with tools logged small volume of gas at 5213-35 feet followed by oil saturation at 5390-92 feet. The hole was bailed dry at 5401 feet, then yielded 12 gallons of 36-gravity oil, representing 2-hour accumulation.

Fifth test for the Abell deep oil area, Northern Pecos County, involves George T. Abell et al's Rixie 1, southeast corner of Lot 8, H&GN Section 25, Block 9, and the most easterly operation. January lease expiration forced the test, which is to carry large diameter hole in trying for shallow production, but will be continued to the Simpson 5300-foot oil zone if Magnolia Petroleum Company's Baldwin-State 1, located 2/3-mile to the northwest, produces from the Simpson.

The Walker shallow oil pool, Pecos County, was expanded 1/3-mile west through completion of Cheyenne Petroleum Corporation's White-Baker 1, GC&SF Section 87, flowing 108 barrels of 32.6-gravity oil initial after nitro shot at 2068-99 feet. Considerable development is in store for this area, owing to the division of lease ownership into small and odd-shaped tracts.

Stanolind Oil & Gas Company assumed obligation to drill a deep test within a year in acquiring lease on 220 acres out of the northeast half of H&TC Section 3, Block 5, Ward County, and ¾-mile southeast of Gulf Oil Corporation's 7075-foot Silurian oil producer in the Shipley area. The former also paid a bonus of $100 per acre cash and $750 per acre, payable from production. Gulf Oil Corporation was due to spud Wristen Bros. 6-A, east offset to the discovery, late last week.

Geo. P. Livermore and Tom Sloan's Ownby-Shell 1, Yoakum County semi-wildcat and 3 miles northeast of nearest production in the Waples-Platter pool, was drilling at 4715 feet. This test logged top of brown lime at 4330 feet and solid lime at 4690 feet, with an elevation of 3558 feet, making it 15 feet and 45 feet higher structurally than the nearest producer on the two important markers.

Southwest Texas

General Pick Up in Drilling Along Lower Gulf Coast

A general pick up in drilling, especially in wildcat operations, has been noted since the first of the year along the South Texas Gulf Coast. A number of prospects have received new locations, while others are in line for drilling in the near future. This may indicate an upsurge in activity for 1941, bringing the trend back to its drilling level of three years ago.

About 2½ miles northeast of Gregory in a geophysical prospect in San Patricio County, drill-stem test was being run on a sand at 6080-6100 feet, indicated by electric log. Abott & Traxler's Toland 1, Lot 14, Coleman Fulton Pasture Subdivision, had been abandoned at 7013 feet. It then was taken over by D. P. Neill, who plugged back for the first of a series of tests.

On the St. Charles structure in Aransas County, Continental Oil Company plans to make one of the deepest tests ever drilled along the Gulf Coastal trend. St. Charles 3 was making hole below 11,200 feet. It is the second deepest operation in this area.

Gulfboard Oil Corporation et al's State 1, on Mud Island, Aransas County, was still testing around 9000 feet.

McSpadden Company's Clark 1, discovery of the Coloma Creek pool in Calhoun County, is still shut in pending arrangements for drilling a second well. It made a gas and distillate producer. Gas from the well is to be used for fuel for the new operation.

On the Clare and White Leagues prospect, north of LaWard in Jackson County, Humble Oil & Refining Company is making a second test in Egg 1. Having plugged back and perforated at 5286-92 feet, the well showed salt water. A new set of perforations was made higher in the same Marginulina zone.

Stanolind Oil & Gas Company was attempting to control Thompson 1, which is trying to blow out from a new sand nearly 2000 feet below the regular pay in the Rievrside field, Nueces County. Nearly one mile north of the field, the test was perforated at 6926-32 feet. While coming out of the hole with the gun perforating tool, the well attempted to clear itself. It was shut in, pressure building up to 400 pounds against the heavy head of mud. When finally controlled, it is believed that the well will be completed as a large gas and distillate producer.

Humble Oil & Refining Company encountered sands with oil shows at 7649-7657 feet and 7724-34 feet in Flour Bluff State 6-D, deep test on the submerged East Flour Bluff structure in Nueces County. It was going ahead near 8000 feet.

La Gloria Operators Committee's Alby 1, east extension to the La Gloria field and a dual sand completion, tested gas and distillate through perforations at 6139-55 feet, again at 6180-6205 feet

and new perforations were made for a test at 6580-92 feet.

Duval Wildcat Tries Blowout

Argo Oil Corporation's Celso Gonzales 1, 10 miles northwest of Premont, Duval County, was waiting on cement after drill stem was cemented at 6308 feet. The well was drilling at this level when it attempted to blow out despite the fact that 10-pound drilling mud was being used. Rams on the blowout preventer were closed and attempts were made to circulate. Water sand, however, took up the mud and caused the pipe to freeze. About 2500 sacks commercial mud and 10,000 sacks of cement were used in the hole in an effort to control. Plugs will be drilled in the near future and production attempt via perforations. Jackson was topped around 6000 feet and got the showing at 6280-6308 feet. The well originally was drilled to near this level by Henshaw Brothers.

Jim Hogg County's newly discovered Holbein field was extended 3960 feet north as a producer was being completed in M. L. Massingill's Marrs McLean 1, Las Animas Grant. Hole is bottomed at 2811 feet, casing set at 2798 feet, with sand 2798-2802 feet.

Dimmitt Well Producing

Producers Corporation of Nevada's McKnight-Bennett 1, discovery of the Carrizo Springs field in Dimmitt County, was back on production after testing tubing on a packer. The well had flowed and pumped at the rate of 3 barrels of 31-gravity black oil per hour and built up 235 pounds pressure on the casing. The tubing was pulled and the packer set in an effort to bring about a steady flow. The wildcat is in the top of a sand of the Navarro series at 2294½-98 feet. It is believed that the sand is considerably thicker. The well was drilled by W. J. Walton Drilling Company, which also has an interest in the well.

Garwood Well Fighting Water

In an effort to control salt water intrusion, believed to be coming from below the producing sand, a squeeze job was made around 9450 feet in W. R. Davis' Brownson 1-A, Wilcox discovery at Garwood in Colorado County. The well was resuming its tests through perforations at 9423-35 feet. The well had flowed 41 barrels of oil and 137 barrels of salt water in 20 hours through a 12/64-inch choke at last reports. Pressures were 2250 pounds on tubing and 1700 pounds on casing.

McMurrey Refining Company's Lavaca County wildcat near Vienna is still shut down. Casing was cemented last year and the well closed down until weather permitted moving in of equipment for testing.

Atlantic Refining Company's Zingerle, nearly one mile northwest of the Thomaston field, DeWitt County, is reported to have found sufficient showings in the Wilcox to assure an extension to that pool. It was drilling below 8050 feet.

Jack Giblin and Gus Tsesmelis were delayed in completing their wildcat in northwestern Duval County by a fishing job. After perforations were made in Holzapfel 1, Section 178, at 1088-11 feet, bailer was lost and efforts were being made to retrieve it. The well may be opening a new Mirando sand pool in the Munson-Adami sector.

Ask Allowable Increase for North Thompson Field

Operators in the North Thompson field, Fort Bend County, requested 100 barrels per well per day, and exemption from shut-downs. There are 30 wells in the field.

Currently, wells are allowed 69 barrels daily, and are subject to shutdowns, which means a net allowance of 49 barrels per day. Gulf Oil Corporation has filed nominations to buy 3500 barrels daily from the field.

Production is from a sand found between 7700 and 7800 feet. The oil is 37 gravity.

Want Shutdown Exemption

Glenda Oil Company and other operators in the Adami field, Webb County, have requested that the field be exempt from shutdowns. At a hearing before the Texas Railroad Commission last week they presented testimony to show that the water encroachment is increasing rapidly in the field. All of the wells are making water in quantities ranging from 20 to 90 percent, and there has been a marked increase in the water-oil ratio during the past 90 days.

The wells are now permitted to produce 11 barrels daily, and constant production is essential to keep the water from heading up in the wells, according to testimony presented by Gordon Johnson for Glenda Oil Company. Amsco Pipe Line Company will purchase the additional oil.

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Texas Gulf Coast

Alta Loma Well Provides Standard Wild-Well Control

Stanolind Oil & Gas Company completed the third producer in the Alta Loma field, Galveston County 1940 strike, to terminate an unusual operating experience and establish something of a standard in efficient control of wild wells. The completion, Hulen 3, Asa Brigham Survey, was gauged at 374 barrels of 37-gravity oil daily through ⅛-inch choke from Frio sands at 9168-72 feet, with tubing and casing pressures 3800 and 1100 pounds. This hole was the directional well begun when the company's Hulen 1, wild discovery, could not be controlled. Hulen 3 was drilled into the Hulen 1 hole at 8450 feet, and flow was diverted while pipe stuck in Hulen 1 was cut and pulled, casing run, and the well completed. Hulen 3 was then plugged back, straightened, and drilled to the sand for a normal producer.

Three miles southwest of Alta Loma, Cayce Survey, Brazoria County, Strake Petroleum Corporation's Griffith 1, wildcat, was drilling at 9840 feet, with contract depth 9500 feet. This test checked 50-100 feet high with Alta Loma on upper markers, topped Heterostegina at about 8000 feet, normal, and attempted to blow out. Round Marginulina was topped at 9132 feet, 700 feet lower than Alta Loma. As the well was on the down-dip down-throw block, it was carried to present depth. If the Marginulina interval at Alta Loma compares with that in Griffith 1, the Alta Loma 9160-foot Frio sand should occur at 9850 feet (or within a few feet of the drill.

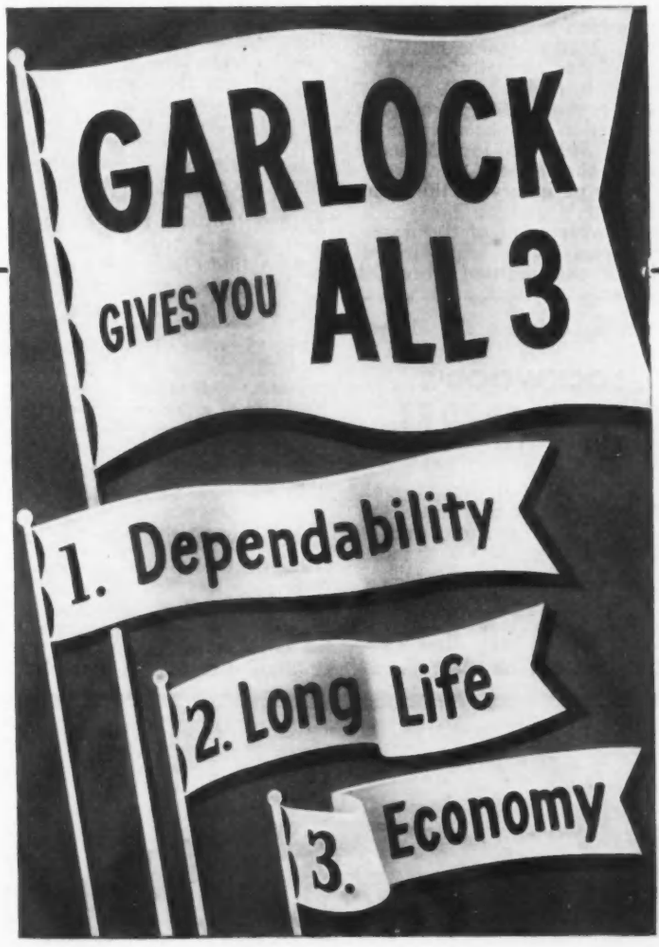
Phillips Petroleum Company took potential on Houston Farms Development Company 2, 1¼-mile west extension to Chocolate Bayou, deep distillate area in Brazoria County, to affirm a new sand. Flow was 283 barrels of 54.8-gravity distillate daily via ¼- and 3/32-inch top and bottom-hole chokes, from 12 perforations at 9675-77 feet. Tubing pressure was 3200 pounds, casing pressure 3250 pounds. Mechanical difficulties were overcome in the company's Triangle Development Company 1, a mile east of production, and it was drilled past 10,100 feet in side-tracked hole.

Dyersdale field, Houston area, Harris County, added four producers and a service well. H. C. Cockburn completed Burkett 8 for 285 barrels of 22.3-gravity oil daily through ¼-inch choke, tubing pressure 220 pounds, casing pressure 310 pounds, from perforations in Frio at 4068-78 feet. Burkett 7 was completed for 220 barrels daily from 4058-68 feet; Burkett 15 for 410 barrels daily from 4063-74 feet, and Burkett 18 for 525 barrels from 4042-46 feet and 4053-58 feet, all with ¼-inch chokes. Cockburn also completed Burkett 1-A, inside location 400 feet southwest of the discovery, in Miocene sand at 3468-78 feet, as a dry gas well to be used as a fuel supply and key well in a gas lift system. A temporary cessation of drilling may be expected here.

Before abandoning Hubbard 3, north outpost at Rowan, Brazoria County distillate field, Humble Oil & Refining Company will test four or five more sands at between 8900 and 9400 feet. Latest test, at 9400 feet, recovered salt water. The well recovered gas-cut mud in the regular 8500-foot sand, and the one-well 8900-foot pay, and apparently marks the north limit of production, as the remaining sands look very poor.

West Columbia, Brazoria County, 25-year-old salt dome production, was subject of comment as Hogg Oil Company completed Hogg 1-A, Martin Varner Survey, 500 feet from the edge of old shallow production, at 4550-75 feet to reopen the southeast side of the field and reveal a faulted segment with some possibilities of extensive production. Potential was 78 barrels of 23.4-gravity oil daily through 5/32-inch choke, with tubing and casing pressures 1400 and 1700 pounds. Operators spudded an east offset, and will keep one rig running to develop the new section.

Galveston Bay activity progressed rapidly, with three wells nearing or in the pay zones at Red Fish Reef. Gulf Oil Corporation's State 1-R-224 was fishing at 10,250 feet. This test is north offset to discovery well, which now has two distillate and one oil pay. Humble Oil & Refining Company had State 5-A-265 below 6304 feet; State 8-A-223 taking side-wall cores at 10,364 feet; State 9-A-263, mile southwest outpost, drilling below 10,091 feet, and State 10-A-249 drilling below 9347 feet.



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Louisiana Gulf Coast

Gueydan Receives New Flank Sand and South Extension

Gueydan, 8-year-old Vermilion Parish 3400-4200-foot field, highlighted the district as Fohs Oil Company completed Mulvey Irrigation Company 2, Section 34-11s-1w, as the first original completion as a flank oil well and a new-sand discovery. Potential on this south extension was 400 barrels of 35.4-gravity oil daily via 10/64-inch choke from 80 perforations at 9722-42 feet, with tubing pressure 1400 pounds, casing pressure 1600 pounds. The test was drilled 650 feet southeast of the company's Mulvey 1, a November, 1940, gas discovery at 9248-54 feet, which later began to flow 35.4-gravity oil from the same sand, and now gauges 205 barrels daily on 10/64-inch choke, with tubing pressure 350 pounds, casing pressure 1000 pounds. All previous production had been from 50 proven acres of 3400-4200-foot Miocene sand on top of the dome. On approximately the same periphery as the Fohs Oil Company wells and on the north, west and southwest sides of the dome, several dry holes have been drilled, which, with the exception of Pure Oil Company's Alliance Trust 1, a 9545-foot failure 2000 feet northwest of Mulvey 1, have been too shallow to yield anything on the extent of the 9200- and 9700-foot sands. Gulf Oil Corporation, The Pure Oil Company and Humble Oil & Refining Company have close-in tracts on the south side, while Fohs Oil Company has the east side of the dome.

The possible opening of a new field at Lowry, or Lakeside, Cameron Parish, was deferred as Lisbon-Iberia Oil Company held Calcasieu National Bank 1, Section 19-12s-4w, for orders after drillstem test at 10,050-060 feet recovered tow stands of distillate and clear water under 1700 pounds pressure. This first test of the prospect logged seven good sands, the first test being performed on the deepest sand, 60 feet thick. Operators may take the well deeper. Casing is now on bottom at 10,215 feet. Superior Oil Company has a high opinion of the old Pure Oil Company prospect, purchasing 1700 acres from Lisbon-Iberia Oil Company for $50,000. This deal was made before the well reached 10,000 feet.

Stanolind Oil & Gas Company opened a new deep sand at West Hackberry, Cameron Parish, gauging School Land 23-B, northwest flank, at 280 barrels of oil in 15 hours via 3/16-inch choke from perforations at 9648-74 feet. Working pressure was 1400 pounds. In March, 1940, the company opened the next deepest sand with School Land 21-C, which had initial potential of 292 barrels of 29-gravity oil daily from 9290-9315 feet, on 5/32-inch choke.

Bayou Des Glaise Looks Bad

Bayou Des Glaise, 14-year-old refraction prospect in Iberville Parish, an abandoned 1940 discovery, appeared even further from production as Humble Oil & Refining Company's Wilberts & Sons Lumber & Shingle Company 3-B, directional test, waited on cement at 7100 feet after test at 7130 feet recovered salt water. The semi-wildcat, Section 78-8s-8e, bid for successful completion in new sand at 7186-90 feet, from which it flowed 10 barrels of 38.2-gravity oil hourly through 3/16-inch choke. The well died, and was squeezed for test at 7120-30 feet which was unsuccessful, then plugged to 7100 feet and was waiting on cement. The discovery, Wilberts 2-B, drilled from the same platform, made 345 barrels of pipe-line oil daily through 3/16-inch choke from 8648-57 feet, produced for a month, died, was drilled deeper, and abandoned. Another of the company's 1940 fields which has been a poor performer, South Crowley, Acadia Parish, had a test in the producing interval as the company's Leger 3, Section 23-10s-1e, drilled past 8710 feet in shale. The company made location on Jeffers tract for another test.

Schooner Bayou, or East White Lake, Vermilion Parish 1940 strike, should be in the news next week with results of a test below 10,500 feet in School Board 1-B, 800 feet east of the discovery. The discovery sand was topped at 10,450 feet, and tubing run for a test over the week end. The company's Louisiana Furs 4, Section 15-15s-1e, 1½-mile northeast extension attempt, was drilling at 8901 feet.

Titanic Oil Company's Marrero Land Company 1, wildcat in the Westwego area that is regarded a certainty for production, was reported in the sand at 9900 feet from which it blew out two months ago. Potential for this Jefferson Parish test was estimated at 450 barrels daily before mechanical difficulties forced a side-tracking job.

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Louisiana Permits

Thirty-six drilling permits were issued last week by the Louisiana Minerals Commission, of which eight were in North Louisiana in the following parishes: Caddo 4, Claiborne 2, LaSalle 1, and Union 1. The 28 in South Louisiana were in the following parishes: Acadia 1, Calcasieu 3, Cameron 1, Evangeline 2, Iberia 3, Jefferson 1, Lafourche 3, Plaquemines 8, St. Bernard 1, St. Martin 2, St. Mary 1, Terrebone 1, and Vermilion 1.

Arkansas Permits

Four drilling permits were issued last week by the Arkansas Oil & Gas Commission, as follows: Columbia County—Louark Producing Company's D. E. Booth C-1, NW NE NE 20-17-19; Lafayette County—Atlantic Refining Company's Bodcaw Lumber Company 3, C NE SW 29-17-23; Bodcaw Lumber Company 4, C SW SW 28-17-23, and Ouachita County—Sam M. Richardson's Goodwin B-3, SE SE SW 32-15-15.

Texas Company Division Office Moved to New Orleans

Effective February 1, the division office of The Texas Company will be moved from Shreveport to New Orleans where the personnel will occupy the fifteenth floor of the Canal Bank Building. Approximately 100 executives and employes will be transferred. A district office will remain in Shreveport.

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North Louisiana

Further Testing Under Way in Athens Discovery Producer

Testing continued last week at Skelly Oil Company and associates' Volentine 1, NE NW 31-20n-6w, discovery well of the Athens field, Claiborne Parish, which showed as a gas/distillate producer several weeks ago in Travis Peak. During the last week this well showed gas/distillate in the Glen Rose lime after casing was perforated at 5826-34 feet and acid was used. It flowed 4½ barrels of dark distillate of 61 gravity per hour through 20/64-inch tubing choke. Operators also plan test of other strata before completing the well.

Hope of obtaining oil below the gas/distillate horizon in the Dubberly-Sibley field, Webster Parish, faded when that horizon tested salt water after a showing of oil, and the hole was plugged back and the well completed as a 50 million cubic foot wet gasser after perforations at 5492-5640 feet. The well is L. M. Moffitt and associates' Kennon 1, SW SE 35-18n-9w. Total depth is 5825 feet.

North Louisiana had only five completions during the week. Two small oil wells were completed in the Pine Island field, Caddo Parish; one small oil well was added at Olla, LaSalle Parish; and a test in the Bull Bayou-Naborton field, DeSoto Parish, was a failure.

L. M. Calhoun of Natchez, Mississippi, made location for a wildcat test in west Caddo Parish, M. G. Scott 1, C NW 8-16-16. It will go to the Travis Peak. H. L. Hunt is reported negotiating with Atlantic Refining Company for some of the latter's wildcat block in Winn Parish near Packton where the Company has recently drilled two dry holes. Gholson and Hodge are reported dropping acreage on a block around Section 35-12n-3e, Caldwell Parish, where they drilled a failure and were required to do further drilling to hold the block.

Southeastern States

Locations for Eleven Tests Made in Tinsley Dome Field

Eleven new locations were announced last week in the Tinsley Dome field, Yazoo County, six being tests by Union Producing Company; four by Love Petroleum Company, and one by Slick-Urschel Oil Company. The locations are in Sections 24, 25, 30 and 35-10n-3w in the southeastern part of the field.

New wildcatting activity continued at a low ebb in Mississippi, there being no new wildcat locations during the week.

Another operation of Union Producing Company in Section 30-10n-3w, at Tinsley Dome, showed a large thickness of oil saturation. This is Florence Harris 4, which logged saturated oil sand and lime from 4930 to 5000 feet and drilled to 5045 feet in shale and lime. Casing was run after electrical survey. The week before the same company's Florence Harris 3, located in the same section had logged saturation from 4908-82 feet. The latter well was completed last week, flowing into pits without gauge, after 7-inch casing was perforated with 190 shots between 4906-44 feet.

During the week Union Producing Company acidized three producing wells at Tinsley Dome in an effort to increase production.

Mellen & Gear's E. K. Woods 1, SE SE 21-4s-11w, Tishomingo County wildcat, showed gas at 1588-94 feet but drilled ahead at 1600 feet in dolomitic limestone. The gas showed the following analysis: carbon dioxide, zero; oxygen, 0.3 percent; methane, 95.5 percent; ethane, 3.0 percent; and nitrogen, 1.2 percent. With elevation of 540 feet, this test showed the following tops of formations: Tuscumbia, 49 feet; Maury shale, 450 feet; Chattanooga Black shale, 459 feet; Brownsport, 469; Wayne, 726; Trenton, 807; Carters, 1032 feet. First gas appeared at 1052 feet.

R. W. Williams of Shreveport leased 14,000 acres in township 12 north, ranges 7 and 8 east, with obligation to start a 5000-foot test by May 1. Gulf Oil Corporation has acquired some acreage in this area.

An early test by Magnolia Petroleum Company on a wildcat block in townships 8 and 9 north, range 14 east, Lauderdale County, is anticipated.

E. C. Johnston has rigged up to deepen to 7000 feet, W. E. Hall's Irby Charping 1, C NE NW 29-10n-8w, Issaquena County wildcat, drilled to 5040 feet in Glen Rose by Hall.

Sun Oil Company continues to drill core hole tests on its holdings in Covington County, latest location being James Speed 2, SE SW 6-8n-14w.

Lewis A. Ellis has had a geological survey made recently of his large block of acreage at Haleyville, Alabama, near the Winston-Marion County line.

Applications for a number of permits for the Tinsley Dome field, Yazoo County, on tracts smaller than the requisite 40 acres, will be heard at a meeting of the Mississippi State Oil and Gas Board at Jackson February 3.

California

Oak Canyon Test Indicates New Field, 350-Barrel Initial

First new oil field discovery in California for 1941 appears to have been made by Western Gulf Oil Company in the Oak Canyon area of Los Angeles County, four miles northwest of the Del Valle field recently discovered by R. E. Havenstrite. Formation test run on the company's Lechler 1, Section 31-4-17 indicated a well capable of producing approximately 350 barrels daily, 21.5-gravity oil. Casing has been run for completion.

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Modelo was placed at approximately 1150 feet. In interval from 2290 to bottom sandy shale with an accumulation of 82 feet of fairly promising oil sand was encountered. In a preliminary formation test on 20 feet of zone to 2310 feet recovery showed 4 stands of oil and gas-cut mud with no water present. Estimated gas rate was placed at 750,000 cubic feet. Test on interval 2290 to bottom resulted in recovery of 16 stands of gas-cut mud and oil with about 5 stands of muddy water and 5 stands of oily mud and oil.

Western Gulf Oil Company holds a block of 1800 acres in the area which it is believed practically blankets the structure. Some neighboring acreage to the southwest is held by Hathaway Oil Company and may merit a test. To the south The Texas Company has some acreage. Should discovery develop into a commercial field it would mark Western Gulf Oil Company's third field discovery in California, the Fruitvale and Paloma fields in Kern County having previously been credited to it.

Standard Oil Company's LAI 3-1, southwestern flank deep test in the Inglewood field in Los Angeles County, has been taken to 8922 feet and continues to core with no definite indications being reported. At the north end of the field R. R. Bush-Federal Oil Company's Smith 1, a deep test, is preparing to core at 7915 feet.

In the South Rosecrans area of Los Angeles County Midfield Oil Company's Murdock 1 is drilling and coring below 9250 feet after having determined that showings previously logged probably would not justify a production test. This is the deepest test yet drilled in this area. To the west of this test South Basin Oil Company has completed its 102 flowing 410 barrels daily, from 7986 feet.

Half a mile east of Stevens zone production in the Strand field in Kern County, Tide Water Associated Oil Company is drilling a test below 11,400 feet searching for the Vedder sand. This is the first test for this area below the Stevens sand which lies at about 9000 feet. The company is planning further exploratory work farther to the east of the proven section when the present test is concluded.

Standard Oil Company is coring at 11,679 feet in its KCL 11-25 deep test on the northeastern flank of the Greeley field in Kern County. The base of a grit zone was placed at 11,599 feet. At present depth well is coring coarse-grained sand with no cut or odor. Some 10 feet of poor oil sand was found from 11,642 to 11,659 feet.

In the Penoche Hills area in western Fresno County Jergins Oil Company's Cheney Ranch 2, bottomed at 7354 feet, on production test flowed for brief period at estimated 200 barrels daily rate, 54-gravity distillate, but quickly died when gas broke through. Shortly thereafter well began making estimated 600 to 1000 barrels daily salt water. Operator has placed productive area in the Cretaceous and test is being watched with considerable interest.

Standard Oil Company has temporarily suspended drilling on Tippetts 2-1, wildcat gas test in Section 9-12-3, Rumsey Hills area, Yolo County, which is bottomed at 3245 feet in gray sand and shale. Formation test of interval from 3180 to 3245 feet showed light blow, recovery consisting of salt water.

Michigan

Confirmation Tests for Marion Reveal Two New Pays

The Marion pool, Clare County, now in its first stage of confirmation beyond the discovery drilled in November, last year, loomed as an enigma with the first two follow-up tests drilling pays in different zones, and neither in the same zone as the discovery. Rowmor and Hughes' Wyman 1, Section 29-20n-6w, the discovery, is producing from Dundee dolomite topped at 3858 feet and bottomed at 3772 feet. It went as high as 243 barrels in 24 hours after acid, but leveled off within a week to 75 to 85 barrels on the pump where it has held since.

Pure Oil Company's Swindlehurst 1, C E½ NE NW 32-20n-6w, diagonal southwest offset on a 20-acre pattern, logged Dundee lime at 3728 feet and drilled the section dry to 3765 feet, top of Monroe dolomite. An oil saturation zone was logged at 3766-68 feet, with 100 feet of free oil in two hours. Drilling was halted for test. Meanwhile, Sun Oil Company's Thayer 1, C E SE SW 29, 660 feet west of Wyman 1 and 1320 feet north of Swindlehurst 1, had Traverse lime at 3076 feet and drilled an oil pay in this zone at 3125-31 feet, bottoming for test at 3156 feet. Test carried 2000 feet of oil in 10 hours, and by swab recovered 108 barrels of oil in five days. Casing and tubing were set, and operators announced intentions to acidize. Neither The Pure Oil Company or the Rowmor and Hughes wells showed in the Traverse, and structurally both Swindlehurst 1 and Thayer 1 were 16 feet higher than the discovery.

Acid treatment boosted production from 126 to 450 barrels through ¾-inch choke at Daily Crude Oil Company's Weatherby 3, SW SE SE 20-12n-9w, Montcalm County, a 1320-foot east extension to the lone producing discovery in Winfield township, drilled four years ago, and followed by several dry holes. Production is from Monroe limestone at 3356 feet. Weatherby 3 is expected to revive the play.

A ¾-mile west extension to the Dundee producing horizon area of the Kawkawlin-Monitor field, Bay County, appeared likely with Chapman Oil Company's Rechstiener 1, NE 3-14n-4e, carrying 2150 feet of oil in 14 hours at 2891 feet, bottom hole. Dundee top was at 2725 feet. The test appears to extend the Dunde horizon nearly a mile west, and it is three miles west of the discovery drilled in the same horizon by Gulf Refining Company in 1938. Rechstiener 1 is a mile northwest of Gulf Refining Company's Bateson 1, SE SE 2-14n-4e, state's deepest test at 7776 feet, where rigging up of a new rotary rig was scheduled to be completed late in the week. At 7776 feet, where a blowout and fire halted operations December 5, test has been making about 1,330,000 feet of gas and 36 to 48 barrels of high-gravity distillate through a 3/16-inch choke and 2100 pounds casing pressure for 15 days. On a larger choke, gas production went over 4,000,000 feet and distillate production rose to 84 barrels in 24 hours.

Welsh Oil Company was credited with completing the first Michigan discovery for 1941 with Cussen 1, SW SW NW 5-12n-6w, pumping 5 barrels a day after repeated acid and nitro shots in a Traverse-lime zone. Hole is bottomed at 1840 feet.

Rocky Mountain Area

Five New Starts Return District Activity to Normal

Mountain states' drilling activity moved back toward its normal swing during the past week as operators announced several new well locations, and the trend of operations moved upward from the slump of the year-end period. Five new starts were recorded, three of which were in Wyoming and two in Montana. All new Wyoming locations were in the Lance Creek field, Niobrara County, the state's largest producing pool and now again in the top place as the most active drilling field in the state.

An old Sundance producer in the Lance Creek field, Continental Oil Company's Otto Rohlff 6, is to be deepened for recompletion in the Minelusa formations. Well was originally completed in 1936 at 3819 feet, and made 2200 barrels initial. Location is in CSW SW 32-36n-65w, within the proved producing area of the pool.

Included in new starts for Montana was Montana Gas Corporation's Bjornsen 2, SE NE NW 34-32n-19e, for which location was released in the Bowes gas field, Blaine County. Operators were shut down at 765 feet, waiting on cement to set around 8¼-inch casing.

In the Bowdoin gas field, Phillips County, Montana, Montana-Dakota Utilities' No. 623 has started drilling in CNW NE 34-32n-33e. Operators cemented 5½-inch casing at 701 feet and were waiting on cement.

Drilling was under way on Mountain Fuel Supply Company's recent start in the Powder Wash field, Moffat County, Northwest Colorado. D. W. Musser 2-A, CW NW SW 4-11n-97w, was spudded to 318 feet, and has cemented 219 feet of 10¾-inch surface pipe. This is the first test to drill in this field in several years.

A near completion for the Northwest Colorado sector is The Texas Company and The California Company's Unit 5, NE NE NE 34-3n-94w, drilled in the jointly operated Wilson Creek field, Rio Blanco County. Operators have hole down 5950 feet, seeking the Morrison sand.

Production test is to be run of an oil show encountered at 560-86 feet in a test well drilled by Joseph Dornacher in the Newcastle area, Weston County, northeast Wyoming. Operator was running 6⅝-inch pipe, to be set at 560 feet for the test.

D. E. BRYAN, an assistant to the purchasing agent of Magnolia Petroleum Company, Dallas, has returned to duty after being ill 11 weeks.

UNITED STATES WELL COMPLETIONS

Company, Well and Location — Init. Prod. Bbls. — Depth

Arkansas

Clark County (Wildcat)—
Coker Oil Corp., Guess 2, 2-11-20... sw 676
Columbia County (Magnolia)—
Louark Prod. Co., Booth B-1, 20-17-19 ... 570 7517
Ouachita County (Mount Holly)—
A. D. Mason et al, Cook Est. 2, 27-15-18 ... sw 2278
Union County (Rainbow City)—
Adams & Coffee, Schmidt 1, 15-17-14 ... * 3075
Union County (Urbana)—
C. H. Lyons et al, Winn Est. A-1, 11-18-13 ... * 3608

California

Fresno County (Coalinga-Northeast)—
Amerada Pet. Corp., Ewing 24-20B 600 8194
Wilshire Annex Oil Co., 53-30B..no est. 8256
Fresno County (East Coalinga Eocene)—
E. L. Cord, No. 1.....no est. 8262
Superior, Cagle B-7.....1575 8047
Kern County (Coles Levee)—
Richfield, KCL-C 47-4..... 500 9360
Fresno County (Kettleman North Dome)—
Robert S. Lytle, Felix 5..... 500 10872
Kern County (Round Mountain)—
E. C. Brown, Gibson 1..... * 1252
Los Angeles County (Long Beach)—
Treadwell Corp., No. 1..... 55 4620
Los Angeles County (Rosecrans-Athens)—
Rainbow Pet. Co., Crawford 21..... 80 8543
South Basin Oil Co., No. 102..... 410 7986
Los Angeles County (Torrance)—
Silver Pet. Co., No. 1..... 80 3761
Los Angeles County (Wilmington)—
Atlantic Oil Co., No. 18.....no est. 5788
Coast Line Oil Co., No. 2..... 150 3710
Exeter Oil Co., "L" Comm. 1..... 175 3714
Arthur J. Louden, Mitchell Comm. 3 120 3488
Security Dr. Co., No. 1..... 125 3637
Orange County (East Coyote)—
Graham & Loftus, G. & L. No. 16.. 30 3332
Orange County (Huntington Beach)—
Signal, Signal-Bolsa 11..... 351 3686
Signal-Bolsa 16 ..... 239 3835
Southwest Explor. Co., State 34.... 434 5250
Santa Barbara County (Santa Barbara Mesa)—
Transoceanic Oil Corp., M'divani-Wallace 1A 25 1705
Tulare County (Tracy)—
Standard, Blewett Comm. 1.....¶9.0 3872

Illinois

Bond County—
A. B. Hanna, Carey 1, sw ne sw sw 28-4n-3w ..... * 590
Joe Harding, Gottfried 1, ne nw ne 28-5n-4w ..... * 929
Clark County—
Strickler, McFarland 1, sw nw ne sw 19-10n-13w (PB 1410)..... 5 2764
Clinton County—
Holmet et al, Cooksey 1, ne ne ne 23-1n-1w ..... * 1456
Williams & Lynn, Thos Est. 1, sw ne nw 24-2n-1w ..... * 1605
Edwards County—
Wall & Mitchell, Stewart 1, sw sw sw 12-1s-10e ..... * 3407
Noah & Morrison, West Barnes 3, sw sw se 13-2s-10e 35 3213
West Barnes 1, se nw ne 24-2s-10e 75 3193
Jarvis et al, Wicke 2, se sw ne 24-2s-10e 130 3219
Fayette County—
Allied Oil Co. et al, Doran 1, c w½ se se 9-4n-1w ..... * 1703
Elmer Turner, Pruett 1, ne se sw nw 7-5n-3e ..... * 1935
Ohio, Williams 12, se ne sw 36-6n-2e 90 1614
Magnolia, Clow 35, ne nw ne 5-7n-3e 440 1545
Clow 37, sw ne sw ne 5-7n-3e .. 166 1537
Franklin County—
Benedum-Trees, McCrary 1, se se sw 27-7s-4e 79 3188
Vandenbark, U. S. Guaranty Co. 1, nw sw se 34-7s-4e ..... * 3193
Helmerich & Payne, Sanders 2, ne nw nw 35-7s-4e 50 3112
Hamilton County—
H. E. Ledbetter, Hunt 1, se ne sw 13-5s-5e ..... * 3567
Exchange, Steele 4, sw ne se 27-5s-6e 64 2960
Steel 5, ne nw se 27-5s-6e 50 2962
Friel 13, ne se sw 34-5s-6e (PB 2967) 180 3099
Shell, Porter 8, sw sw se 34-5s-6e.. 225 2960
Jasper County—
Pure, Rogers 2, c w½ ne sw 8-5n-10e 1123 2833
Craig Cons. 1, c e½ nw sw 20-5n-10e 1326 2835
Kermicle 2, e½ se se 32-6n-10e..1368 2825
Frohning 1, c n½ sw sw 33-6n-10e 278 2825
Macoupin County—
Fred Mudgett, Dorks 1, ne c ne 30-10n-7w ..... * 562
Monroe County—
Regent Oil Co., Gummershimer 7, nec sw nw 2-2s-10w 20 468
Montgomery County—
J. E. Hood, Dambacher 1, se ne se 16-12n-5w ..... * 1019
Wabash County—
Joe Young, Stilwell 6, se ne nw se 1-1n-12w 250 2021
Kingwood, Bump 3, se se nw 9-2s-13w 140 2464
Burr Lambert, Buchholz 2, ne se sw ne 9-3s-13w 26 2425
Phillips Pet. et al, Schultz 10, nw 7-3s-13w 131 2501
W. W. Gray, Fee 12, se ne ne sw 14-3s-14w 250 2525
Washington County—
Magnolia, Rahn 7, se ne ne 22-1s-1w 29 1543
Gill 1, ne ne nw 35-3s-3w ..... * 1316
Renwaldt, Bander 1, nw nw nw 20-3s-1w 48 1372
Woodriver Crude Oil Co., Kazban 1, ne se sw nw 2-3s-3w ..... * 1660
White County—
Arrow Dr., Crooks 1, se ne se sw 28-3s-14w (PB 1917) ..... * 2965
Hon 1, nw se se 32-3s-14w (PB 2736) 30 2741
F. J. Cornwell et al, Felix 3, swc se ne 19-3s-8e 250 3254
Tide Water, Evans 3, se sw ne nw 4-4s-14w 75 2814
Dennis 9, se nw ne 33-4s-14w..... 225 2726
Rochill Oil Co., Hon 1, ne nw nw 5-4s-14w ..... * 3164
Bell Bros., Skiles 2, sw nw sw 16-4s-14w 155 2719
Pure, Calvin 5, ne nw nw 16-4s-14w 189 2860
Walter Duncan, Hughes 3, ne ne se 17-4s-14w 150 2720
Chet Evarts et al, Knight 1, se sw nw sw 17-4s-14w ..... * 3107
Cherry & Kidd, Gray 4, sw nw ne 17-4s-14w 145 2710
Gray 4, sw ne nw 17-4s-14w 130 2719

[*Continued on next page*]

*Failures; †Junked; ¶Million cu. ft. gas.

Summary of Drilling Operations in the United States, Week Ended January 18, 1941

	WELLS COMPLETED								PERMITS FOR NEW WELLS*				
		New Wells Drilled for Oil and Gas											
	Total for Week	Oil Wells	Gas Wells	Failures	Initial Oil Production	†Miscellaneous	Total 1941	Total this Date 1940	This Week	Total this Month	Total 1941	Total this Date 1940	Year Total 1940
Alabama	.....	....	....	....	.....	....	....	.....	....	.....	....	.....	.....
Arizona	.....	....	....	....	.....	....	....	.....	....	.....	....	.....	.....
Arkansas	5	1	....	4	570	....	11	17	4	10	10	4	153
California	22	20	1	1	5,449	....	69	70	12	39	39	69	1,102
Colorado	.....	....	....	....	.....	....	....	2	....	.....	....	.....	.....
Florida	.....	....	....	....	.....	....	....	.....	....	.....	....	.....	.....
Georgia	.....	....	....	....	.....	....	....	.....	....	.....	....	.....	.....
Illinois	64	45	....	15	9,679	4	183	269	47	192	192	285	4,532
Indiana	14	6	....	2	788	6	28	32	....	.....	....	.....	.....
Kansas	31	21	....	6	31,805	4	102	116	47	97	97	97	2,048
Kentucky	8	3	....	5	100	....	14	28	....	.....	....	.....	.....
Louisiana	15	9	1	5	1,565	....	66	132	36	78	78	74	1,658
Michigan	15	3	1	11	130	....	46	116	18	45	45	119	1,093
Mississippi	.....	....	....	....	.....	....	7	12	....	.....	....	.....	.....
Missouri*	.....	....	....	....	.....	....	....	.....	....	.....	....	.....	26
Montana	2	2	....	....	135	....	8	20	....	.....	....	.....	....
Nebraska*	8	2	....	5	165	1	11	.....	1	2	2	.....	69
New Mexico	2	1	1	....	1,200	....	17	67	7	23	23	56	559
New York	15	7	1	....	48	7	31	85	....	.....	....	.....	.....
North Dakota	.....	....	....	....	.....	....	....	.....	....	.....	....	.....	.....
Ohio	.....	....	....	....	.....	....	48	94	....	.....	....	.....	.....
Oklahoma	39	19	3	14	5,085	3	120	154	38	104	104	116	1,888
Pennsylvania	19	13	1	3	45	2	89	274	....	.....	....	.....	.....
South Dakota	.....	....	....	....	.....	....	....	.....	....	.....	....	.....	.....
Tennessee	.....	....	....	....	.....	....	....	5	....	.....	....	.....	.....
Texas	187	135	7	44	76,015	1	422	742	....	79	79	767	11,170
Utah	.....	....	....	....	.....	....	....	.....	....	.....	....	.....	.....
West Virginia	.....	....	....	....	.....	....	....	54	....	.....	....	24	603‡
Wyoming	2	2	....	....	164	....	31	14	....	.....	....	.....	1
Total this week	448	289	16	115	132,943	28	1,303	2,298	210	669	669	1,611	24,902
Total last week	478	330	43	105	182,121	....	859	1,745	188	459	459	1,184	24,902
Total this year	1,307	1,881	101	297	467,582	....	....	.....	....	.....	....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Missouri date from August 10, 1940; Nebraska from August 3, 1940.
† Includes old wells deepened, water-intake, gas input, and salt water disposal wells. ‡ For first 9 months of 1940.

United States Well Completions—*Continued*

ILLINOIS—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
W. W. Gray, Fee 6, ne se nw 17-4s-14w	175	2710
Skelly, Daly Tr 2, se ne sw 17-4s-14w	100	2724
Wilson 1, se sw ne 11-6s-9e	165	2280
P. E. Tipton et al, Boultinghouse 3, ne se ne 17-4s-14w	240	2723
K. B. Yost, Bramlett 4, se nw nw se 17-4s-14w	78	2578
Sun, Greathouse 19, ne nw se 33-4s-14w	102	2720
Superior, Ford 2, ne se sw 27-4s-14w	173	2945
Ford 4, nw nw nw 34-4s-14w	170	2909
Greathouse 6, se ne ne ne 4-5s-14w	220	2920
Ford 4, nw nw ne 9-5s-14w	60	2191
A. W. Gerson, Belva 1, nw ne nw 6-4s-8e	120	3224
R. B. Martin, Westergard 1, se sw se 19-6s-11e	*	3100

OLD WELLS DEEPENED

Bond County—

Arrow Dr. Co., Spindler 5, nw nw sw 10-6n-2w (OTD 990)	64	1018

Clinton County—

Schwartz, Shafley, se ne se 3-2n-3w (OTD 3530)	*	4120

Edwards County—

Superior, Works 7, sw sw sw 18-2s-11e (OTD 3150)	84	3201

Salt Water Disposal Wells

Gulf, Stanton 1, nec nw nw 26-1s-1w	...	1204

Indiana

Daviess County—

J. W. Cannon, Evans 5, nw se se ne 8-2n-5w	14	613

Gibson County—

Continental Oil, Bozeman 21, sw se ne 23-3s-14w (PB 2843)	200	3008
Papoose Oil, Cooper 1, sw ne se 24-3s-14w (PB 2854)	47	2968

Pike County—

Murphey Oil, Stewart 7, sw nw ne nw 26-1n-9w	*	989
Schroeder & Herman, Strouble 1, sw sw sw 34-1s-9w	*	1753

Posey County—

Tide Water Oil, Doll 3, swc se se 33-3s-14w (PB 2570)	40	2822
W. C. McBride, Swonders 9, sw c ne ne 4-4s-14w	20	2815

Vanderburg County—

K. R. Bixby, Trs., Glaser 5, nw nw 31-5s-11w	40	1219

OLD WELLS DEEPENED

Posey County—

Superior Oil Co., New Harmony Realty Corp. 11, se nw sw 10-5s-14w (OTD 2188)	150	2232
New Harmony Realty Corp. 12, nw sw sw 10-5s-14w (OTD 2170)	49	2206
New Harmony Realty Corp. 13, nw se sw 10-5s-14w (OTD 2196)	75	2222
New Harmony Realty Corp. 14, se sw sw 10-5s-14w (OTD 2213)	52	2219
New Harmony Realty Corp. 15, sw ne sw 10-5s-14w (OTD 2204)	51	2226
New Harmony Realty Corp. 16, sw sw sw 10-5s-14w (OTD 2183)	50	2204

Kansas

Barber County—

Derby et al, Hancock 1, c se se 10-32-12w	*	4840

Barton County—

Day et al, Dolecheck 2, c s½ nw sw 13-16-12w	3000	3364
Carter et al, Kraft 6, c e½ ne ne 10-17-11w	3000	3284
Magnolia, Roesler 2, c s½ ne nw 1-18-11w	*	3380
I. T. I. O., Schreppel "A" 7, c s½ nw ne 26-20-11w	128	3323

Butler County—

Plymate et al, Owen 1, nw ne ne 19-29-4e	72	1896

Cowley County—

Wakefield et al, Durham 1, c w½ nw se 34-30-3e	*	3430
G. Smith et al, Finney 1, nwc 36-30-4e	*	3027
Ryan, Kennedy 1, sec sw 12-30-5e	734	2838
Victory Life 1, swc se 12-30-5e	2240	2846

Ellis County—

Dickey, Gumple 2, c n½ sw se 6-11-17w	1158	3447
Aladdin et al, Kuhn 1, c n½ nw nw 17-14-16w	*	3500

Ellsworth County—

Jayhawk, Talsky 3, cwl nw se se 5-16-10w	65	3317
Magnolia, Haska 2, c e½ se sw 5-16-10w	110	3327
Atlantic, Matosh "B" 1, c n½ se ne 34-16-10w	10	3322
Cities Service, Hansen "B" 1, sw nw nw 33-5s-20w	2215	3584

Rice County—

Westgate-Greenland, Johnson 4, c s½ sw se 24-20-6w	1789	3328
Bay, Mitchell 1, c s½ sw sw 3-20-9w	454	3243

Rooks County—

Consumers Co-Operative, Beardmore 5, c s½ ne ne 10-9-16w	2327	3197

Russell County—

Schneider et al, Kaps 1, c n½ nw nw 17-14-12w (pb 2981 ft)	955	3057
Texas, Kiel 1, nw se 36-14-14w (pb 2997 ft)	1324	3132
Cities Service, Rogg "D" 2, sw nw ne 9-15-13w	1113	3321
Helmerich & Payne, Sylvia 1, c e½ se nw 20-15-13w	1118	3171

Stafford County—

Shell, Smith "B" 1, nec 16-21-11w	*	3631
Moore, Stewart 6, c n½ sw se 12-24-11w	3000	3744
Landon, Equitable Life 4, c w½ nw ne 15-24-11w	1824	3800
Skelly et al, Kipp "A" 2, c n½ se ne 27-25-14w	1587	3889

OLD WELLS DEEPENED

Cowley County—

Stelbar, Bahruth "A" 1, ne se ne 8-34-3e (otd 3312 ft)	425	3737

Russell County—

Darby, Dumler "C" 2, swc ne 11-14-15w (otd 3072 ft)	157	3118

Stafford County—

Stanolind, Hays 9, c n½ ne se 11-24-11w (otd 3763 ft)	3000	3790

SALT WATER DISPOSAL WELLS

Woodson County—

Barbara, Schaffer 11, c nw se 31-23-14e (otd 1574 ft)	...	1744

Kentucky

Butler County—

Jack Cox et al, Taylor 1	*	1157

Daviess County—

Ohio Oil, Coombs 9	50	1268
Master Oil, Richmond 11	10	1226
J. C. Ellis, Fee 1	40	1703
Walter Sargent et al, Mohon 1	*	1823

Henderson County—

L. F. Boone, Sand Island 1	*	2664

Ohio County—

Huppe et al, Livermore 3	*	1438
Sohio Prod., Mitchell 9	*	628

South Louisiana

Bayou Bouillon—

Superior of Cal., St. Martin 1-A 25 & Rycade 5	¶1.4 *	7465 4372

Bateman Lake—

Texas, Atchafalaya Basin 1	*	11,262

Chalkley—

Shell, Hanszen 8	421	10,172

Charenton—

Pan American, South Coast 9	*	3068

Eola—

Crosby Dr. Co., Whitlow 1	340	8530

Golden Meadows—

Bateman Dr., Collins 1	180	5520
Collins 2	189	5200

Ville Platte—

Continental, Ortego 1	200	10,230

Terrebonne Parish—

Barnsdall, Nelson 2, Point Au Fer	*	11,401

North Louisiana

Caddo Parish (Pine Island)—

L. L. Sugar, Fee 1, 32-21n-15w	25	2114
Texas Co., Raines 8, 27-21n-15w	100	1582

De Soto Parish (Bull Bayou Naborton)—

George Lilley et al, Allbritton 1, 25-12n-11w	*	2745

La Salle Parish (Olla)—

Placid Oil Co., La. Cent. Lbr. Co. 68, 36-10n-2e	85	2407

Webster Parish (Dubberly-Sibleyo)—

L. M. Moffitt et al, Kennon 1, 35-18n-9w	¶50.0	5825

Montana

Glacier County (Cut Bank)—

Texas Co., Purdy 6, ne se sw 35-35n-6w	100	2877

Toole County (Kevin-Sunburst)—

Twin Fields Petroleum, Thompson 3, nw nw se 28-35n-3w	35	1783

Wyoming

Niobrara County (Lance Creek)—

Continental Oil Co., Bell 22, csw ne ne 34-36n-65w	144	5326

Sublette County (LaBarge)—

North LaBarge Oil Co., Government 6, cnl se ne 28-27n-113w	20	1216

Nebraska

Richardson County—

Uhri, Wittwer 1, ne se sw 8-1n-14e	*	74
Ogle 1, sw ne ne se 9-1n-14e	*	2250
Powers & Stalker, Lee 1, ne nw ne 16-1n-14e	*	2341
Shaffer et al, Sandrock 2, ne nw sw 20-1n-16e	100	2267
Sandrock 3, nw sw nw 20-1n-16e	*	2270
Skelly, Davidson 3, se nw ne 20-1n-16e	50	2268
I. T. I. O., Ege 1, c ne se 19-3n-16e	*	2651

New Mexico

Eddy County—

Brewer Dr. Co., Kindle 1, swc ne 26-18s-26e	¶1½	995

Lea County (Maljamar)—

Barney Cockburn et al, Baish 30-B, c se sw 28-17s-32e	1200	4025

New York

Allegany County—

Ebenezer Oil Co., Norton farm, Alma	5	1670
Moore & Repp, Hatch farm, Wirt	6	1279
Forest Oil Co., Ackerman farm, Bolivar	10	1463
N. V. V. Franchot, Reddy farm, Bolivar	8	1532
Karl-Weller Oil Corp., Swarthout farm, Genesee	8	1464
Sloan & Zook, McDivitt farm, Bolivar	5	1387
Jacob Trenkle Estate, Hill farm, Genesee	6	1432
Hanley & Bird, Smith-Kellogg farm, Allen township, gas, 8,000,000 cu. ft	....	3110

Water Intake Wells—

Franchot Oil Co., Murphy farm, Bolivar	...	1562
Bradley Prod. Corp., Duke farm, Alma	...	1562
Hardy & McBride, Garthwaite farm, Alma	...	1353
Bradley Prod. Corp., Fritz-Carrol lot, Bolivar	...	1444
L. H. Thornton et al, Fassett farm, Willing	...	1349
L. H. Richardson et al, Browning farm, Scio	...	926
C. L. Wann et al, fee farm, Genesee	...	1439

Oklahoma

Carter County—

Magnolia, Richards 84, ne sw se 31-3s-3w	74	1123
Anderson, Fee 1, ne se nw 18-4s-2w	*	3308

Creek County—

Brauer Bros., King 1-A, ne sw se nw 31-16n-7e	¶2.0	1190
Tilley et al, Wright 4-B, se ne se 17-17n-8e	15	2334
Kirchner et al, Kelley 2, sw ne ne 20-17n-9e	45	2558
Strozier, Anicker 1, se ne nw 18-17n-10e	*	3105
Adamson, Anthis 1, ne nw nw 15-18n-10e	*	2225
Giblin, Reed 1, se nw se 31-18n-10e	*	2314
Smith et al, Hohl 1, se se sw ne 26-19n-7e	20	2720

Garvin County—

Cox et al, Pape 4, nw sw sw 29-1n-3w (pb 2070 ft)	40	2615

Logan County—

Danciger, Rout 1, c nw ne 3-17n-4w	*	5195

McIntosh County—

McNutt et al, Lover 1, swc se 1-12n-16e	¶3.0	1844

Okfuskee County—

Sunray, Replogle 1, ne sw se 35-11n-8e	485	3492
I. T. I. O., Miller 3, ne nw sw 35-12n-8e	1260	3566

Oklahoma County—

I. T. I. O., Trosper 13, nw se sw 13-11-3w	13	4039

Okmulgee County—

Schock, Douglass 2, nw ne se 17-14n-11e	80	2437

Osage County—

Rogers et al, ne sec 8-21n-9e	2	305
Pinney, 5, ne se ne sw 15-24n-8e	55	2291
Magnolia, 2, sw se nw 14-26n-6e	100	2886
Stevenson et al, 4, nw ne se sw 27-28n-10e (pb 1422 ft)	2½	1501

Payne County—

Warren - Bradshaw, Flannagan 1, nwc se 20-19n-2e	*	4670

Pontotoc County—

Mitchell, Skirvin 1, ne se se 10-4n-6e (pb 796 ft)	6	1615
Norville et al, Doner 1, c ne se 24-5n-6e	¶10.0	2006

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Seminole County—		
Mohican, Settle 1, nwc sw 30-7n-7e	•	2290
Moore et al, Harrison 1, sw nw se 4-8n-7e	40	3238
Stephens County—		
McAlester, Wade "B" 5, sw se sw se 11-2s-8w	•	2425
Tulsa County—		
Brockman, Phillips 3, ne sw se 15-19n-11e (pb 1930 ft)	2	2090
Norris, Phillips 1, nw nwc 23-21n-12e	•	1934
Wagoner County—		
Miezer, Lowe 1, sw nw c ne 16-16n-18e	•	1100
James, Robson 1, se sw se sw 15-19n-15e	•	930
Davis et al, Robson 1, nec nw 21-19n-15e	•	1040
Pierce, Gregory 17, nec 9-19n-16e	•	510
Gregory 18, c e½ ne ne 9-19n-16e	•	505
OLD WELLS DEEPENED		
Caddo County—		
Magnolia, Pau-Kune 2, c n½ nw ne 10-5n-9w (otd 2416 ft)	1652	3396
Carter County—		
Batson, Walker-Voorhees 2, ne nw sw ne 20-4s-2w (otd 1957 ft)	110	2017
Creek County—		
Dunn et al, Cantrell 4, se ne se 34-14n-10e (otd 3193 ft)	70	3298
Pontotoc County—		
Moore, Moody 1, nwc 26-2n-7e (otd 4314 ft)	5	4390
Osage County—		
Finance, 29, c sw 19-23n-9e (otd 2495 ft)	1008	2515
Payne County—		
Amerada et al, Fruin 2, c e½ sw nw 12-17n-1e (otd 4890 ft)	3060	4730
GAS INPUT WELLS		
Osage County—		
Sinclair Prairie, No. 46, nw nw se ne 19-23n-12e	...	1727

Pennsylvania

BRADFORD DISTRICT

N. V. V. Franchot, Campbell	3	....
Quinlan Oil Co., Fee	1	....
Messer Oil Corp., Loop	2	....
Bradford Tr. Co.	19	....
Forest Oil Corp.	2	....
Forest Pet. Corp.	1	....
Niagara Oil Corp.	3	....
F. H. Culbertson, Wright	2	....
Merry Bros., Burger	1	....
Pine Run Oil Co., Bing 130-1-2-3-4-6	4	....
Water Intake Wells—		
Forest Pet. Corp.	..	....
D. Y. M. Corp. 466 Bing 6	..	....
NEW YORK-PENN GAS FIELD		
Higgins et al, Hoyt	•	....
Empire Gas & Fuel Co., Holmes 3	•	....
BUTLER-ARMSTRONG DISTRICT		
Pfeifer & Ethridge, Behm	•	....
MIDDLE DISTRICT		
Crowther Bros., Rossman	½	....
S. R. Lewis et al, Lechner	¶	....
Duke & Church, Duke	2	....
McCool Bros., Lot 80	4	....

Texas Gulf Coast

Alta Loma—		
Stanolind, Hulen 3	374	9180
Anahuac—		
Gulf, Knowles 13	567	7081
Humble, Middleton 48	615	7227
Chocolate Bayou—		
Phillips, Houston FDC 1	283	10,001
Damon Mound—		
Pan American, Koontz 1	•	6499
Dyersdale—		
H. C. Cockburn, Burkett 1-A	¶	4100
Burkett 7	220	4098
Burkett 8	285	4101
Burkett 15	410	4099
Burkett 18	525	4101
Esperson—		
General Crude, Grossman 1	667	7150
W. P. Luse, Hlavaty 4	556	6527
Green's Lake—		
Sun, Hughes 11	108	6875
Magnolia, Humphries 1	84	7647
Hardin—		
Texas, Humphries 5	325	7656
Louise—		
Pure, Lancaster 4	47	5155
Lovell's Lake—		
Humble, Jeff, Ld. Co. 18	147	7790
Red Fish Reef—		
Humble, State 7-A-264	¶	9710
Richardson—		
Josey, Fee 1	¶	7252
Seabreeze—		
Sun, Hoffman 4	526	8516
Tomball—		
Humble, Petrich 6	506	5568
West Columbia—		
Hogg, Hogg 1-A	77	6279
Withers—		
Texas, Pierce C-88	•	5790

South Texas

CORPUS CHRISTI DISTRICT

Aransas County (McCampbell)—		
Mar Prod. Co., Park 1	72	7201
Calhoun County (Wildcat)—		
McSpadden, Clark 1, Thomas Hennessee sur, 1 mi ne Hiawatha Roemer 2, new fld	¶2.0 & 65	6240
Colorado County (Wildcat)—		
Davis & Co., Brownson 1-A, 355-ac tr, E. S. Wooley sur, opens Wilcox sand in Garwood	¶2.0 & 150	10012
Hidalgo County (Nichols)—		
Baldridge & King, Yturria 1	275	3521
Jackson County (Lolita)—		
Humble, L. Ranch 8-A	1000	5930
Magnolia, Mitchell 7	500	5286
Jackson County (West Ranch)—		
Glasscock, Drummond 4-B	950	5820
Humble, Toney 14	¶10.0	5882
Shell, Schuech 3	1250	5763
Jackson County (Wildcat)—		
Mayo and Helmerich & Payne, Coates 1, James Morgan sur, 1 mi se West Ranch	•	6505
Jim Wells County (Ben Bolt)—		
Bridwell, Beasley 8	500	5216
Jim Wells County (Wade City)—		
Rodney Delange, McNeill 14	500	4942
McNeill 22	500	4931
Live Oak County (Wildcats)—		
Danciger, Lewis 1, Thos. Henry sur, 3 mi w Three Rivers	•	1800
Humphries & Hotchkin, Webb 1, Wm. O'Docharty sur, 6 mi s & w Oakville fld	•	2121
Nueces County (Minnie Bock)—		
Averill & Cox, Driscoll 1	•	4765
Nueces County (Stratton)—		
Bay-Tex, Union Central 4	500	6805
Conroe, Sellers 2-B	450	6498
Sellers 3-B	500	6523
Southern Minerals, Stratton 7	500	6610
Nueces County (Agua Dulce)—		
Burwyn, Purl 1	1000	6489
Nueces County (S. Clara Driscoll)—		
Magnolia, Johnson 4	375	5565
Texas Co., Taylor 2	500	5368
San Patricio County (Midway)—		
Midway Victory, Floerke 2-C	•	5350

LAREDO DISTRICT

Duval County (Wildcat)—		
G. W. Bascom, Nueces Ld. & Livestock Co. 1, sur 175, ¾ mi sw Munson fld	•	1227
Jim Hogg County (Colorado)—		
Humble, Atwood 23	125	3112
Atwood 24	250	3027
Humble, King Ranch-Colorado 5-B	325	2925
Sun, Thaxton 17	350	3055
Jim Hogg County (Manila)—		
Navarro Oil Co., Allen 1-B	150	2658
McMullen County (Wildcats)—		
Harry Ezzell, Ezzell 44, sec 9, Ezzell rch subd, 1½ mi sw S. Calliham fld	¶3.0	1546
Dan Purvis, Nueces Ld. & Livestock Co. 1, R. E. Halter sur 26, 7 mi n Munson fld	•	1227
Starr County (Boyle)—		
Fidelity, Standard Trust Co. 5-D	•	3855
Starr County (Rincon)—		
Continental, Slick 41-B	425	4134
Webb County (Wildcat)—		
Seaboard Oil Co., Newton 2, C&M Ry. Co. sur 1531, 19 mi nw Oilton	•	1830
Zapata County (Ecobas)—		
Dulup Oil Co., Garcia 3-C	22	1043

SAN ANTONIO DISTRICT

Bexar County (Gas Ridge)—		
Southwest Dr. Co., Covell 5	2½	425
Covell 6	2¼	425
Bexar County (Wildcat)—		
W. C. Simpson, Joppick 1, 10-ac lse, Igino Teyidor sur, 18 mi sw San Antonio	•	1410
Burnet County (Wildcat)—		
Belanger & Rucker, Evans 1, 10 mi se Marble Falls, 2 mi nw Spice-Woods 1400-ac blk	•	1200
Frio County (Pearsall)—		
Texas Atlas, McWilliams Bros. and Cory 6	500	5611
Gonzales County (Wildcat)—		
M. M. Kinley, Weber 1, 788-ac lse, Thomas Wright sur, 4 mi se Nixon	•	765
Guadalupe County (Elm Creek)—		
E. A. Weyel, Lenz 1	2	720

West Central Texas

Brown County—		
Austin Brown et al, Finch 1	•	1662
Coleman County—		
Anzac Oil Corp., Gay 1	¶3.9	2274
Morris 8-C	344	2201
Lone Star Gas Co., Gay 1	¶4.1	2268
Jones County (Wildcats)—		
G. M. Gillespie et al, King 1	•	2615
L. H. Pearson et al, Carlson 1	•	3501
Snoddy Bros. et al, Jackson 1	•	2472
Jones County—		
Falls Ref. Co., Robinson 5	20	1891
Thos. Humphrey et al, Rust 1	207	2470
F. K. Johnson-Ungren-Frazier, Sayles 1	212	1944
Sayles 3	156	1951
Sandy-Ridge Oil Corp., Brock 2	120	1901
Snoddy Bros., Akens-Sinco 1	•	2587
Shackelford County—		
Dean Bros. and J. B. Robert, Newell 2-K	•	2001
Fortex Oil Corp., Newell 2	•	1202
P. S. Kendrick et al, Mathews 2	•	748
Rhodes & Higher, Davis 18	35	1210
Taylor County—		
Tal-Vez Oil Corp., Smith 1	•	3077

East Texas

Joiner Area—		
Bert Aston & Greenway, Alford 14 (46.45-ac)	1500	3613
Kilgore Area—		
Eula Oil Co., Mayfield 4 (31-ac)	75	3760
Gulf, Florey 1-SW (water input)	•	3823
Hamill & Smith, Heard 2 (19/100-ac)	300	3572
Heard 3 (19/100-ac)	480	3568
Knowles 10, blk 134	360	3567
J. J. Jenkins Dr. Co., King 6, blk 117	500	3575
L. & M. Oil Co., Acuff 3 (1.27-ac)	2000	3577
Overton Ref. Co., I&GN Ry. 19-B (7.88-ac)	720	3575
I&GN Ry. 24-B (7.88-ac)	720	3565
Ed Pace, Tr., Elder 7 (1.51-ac)	600	3568
Elder 11 (1.51-ac)	600	3559
Elder 14 (1.51-ac)	600	3568
Elder 16 (1.51-ac)	650	3562
Shell Oil, Willoughby 30 (57.7-ac)	2400	3600
M. E. Trapp et al, King-Johnson 7 (2.57-ac)	1200	3591
Longview Area—		
Amerada Pet. Corp., Smith 5 (40-ac)	650	3583
O. C. Bailey & Trimble, Jones 11 (15-ac)	2500	3665
Roger Lacy et al, Victory 26 (100-ac)	1500	3668
Grady Vaughn et al, Jones 11 (10-ac)	2000	3651
Anderson County (Long Lake)—		
Tide Water & Seaboard, Martin 1-A (dual well)	¶115 & 67	5313
Franklin County (Talco)—		
Talco Asphalt & Ref. Co., Rutherford 6	672	4282
Limestone County (Wortham)—		
McNeil Pet. Co., Mallard 1	•	3012
McLennan County (Wildcat)—		
H. Lewis et al, Hander 1	•	620
Navarro County (Wildcat)—		
A. J. Willis Jr.-Coker-Moore et al, Edens 1	•	1465
Wood County (Hawkins)—		
Bobby Manziel et al, Bell 1	†	4363
SALT WATER DISPOSAL WELLS		
Kilgore Area—		
Gulf, Florey 1-SW	...	3823

North Texas

Archer County (Wildcat)—		
W. B. Omohundro et al, Coleman 1	•	5959
Archer County (Hull-Silk)—		
Cox & Hamon, Anderson 7	960	4415
Bert Ligon - Deep Oil Dev. Co., Moss 6-A	888	4340
Magnolia, Rutty 16-B	960	3782
Archer County—		
J. L. Alexander et al, White 2	5	463
Art & Spragins, Meade 1	•	974
Cable Oil Co., Webb 13	wi	700
Bert Ligon et al, Little 11-B	10	1363
Archer County (Vogtsberger)—		
W. B. Omohundro et al, Browning 1	•	5147
Baylor County (Mabelle)—		
British-American O. P. Co., Turbeville 2	352	2514
Turbeville 3	336	2529
Baylor County (Rendham)—		
Featherston-Spragins-Art, Green 1	197	3051
Clay County—		
F. H. Gohlke et al, M. Jones 1	•	1733
Johnson-Kouri-Morgan, Taylor 4-39	10	1127
Cooke County (Walnut Bend)—		
Sinclair Prairie, Ramsey 4	885	4779
Jack County—		
Panhandle Ref. Co., Leffel 5	31	2939
Reimers-Walker Oil Corp., Powers 2	2	475
Montague County (Wildcat)—		
Benson & Benson, Benton 1	•	6213
Tom F. Hunter et al, Fatheree-Conoco 1	•	5043
Throckmorton County—		
W. Neustadt et al, McKeicham 3	2	719
McKeicham 4	3	465
A. L. Wasson et al, O'Dell 7	10	373
Wichita County (Wildcat)—		
Akin-Dimock-Costley, Dunn 1	•	1370
Harper-Knappenberger, Ramming 1	•	1405

[*Continued on next page*]

NORTH TEXAS—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Wichita County (K-M-A)—		
Fain-McGaha Oil Corp., Griffin 7-C	776	3830
High Point Oil Co., W. Burnett 2-A	520	4136
Wilbarger County (Wildcat)—		
Consolidated Oil Co., Pollan 1	•	4575
Wilbarger County—		
Pois & Schultz, King 4	25	1640
W. T. Waggoner Est., Fee 29-AA	68	1697
P. F. Watson et al, Waggoner Est. 14	11	522
Young County—		
L. T. Burns et al, Larimore 3	•	900
Henry Craig et al, Schlegel 2-74	•	1161
Geo. Keith Jr. et al, Rogers 3	•	965
Kimmell, Lee & Co., Campbell 2-C	•	978
Tex - Tor Oil and J. McLester, Mosely 3	1000	3805

West Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Cochran County (Duggan-Slaughter)—		
Devonian Oil Co., Boyd 1	678	5050
Crane County (Gulf-McElroy)—		
Gulf, McElroy 235	1234	2991
Crane County (Sand Hills Deep)—		
Humble, Tubb 46-X	70	5794
Crockett County (Crockett)—		
F. & J. Oil Co., University 1	•	1437
Crockett County (Todd Deep)—		
Continental et al, Todd 7	3082	5693
Ector County (Foster)—		
Schermerhorn Oil Corp., Johnson 11-B	718	4175
Ector County (North Cowden)—		
Cities Service, Rhodes 11	3447	4194
T. P. Coal & Oil Co., Holt 6	684	4510
Ector County (Wildcat)—		
Forest Dev. Corp., Edwards 1-B	•	4400
Gaines County (Seminole)—		
Amerada Pet. Corp., Turlin 4	772	5330
T. H. Hahn 2	788	5350
Atlantic Ref. Co., Riley 6-C	815	5312
Magnolia-Atlantic, H. & J. 7-195	357	5245
H. & J. 5-217	411	5307
H. & J. 15-219	432	5248
H. & J. 9-251	442	5287
Gaines County (Wasson)—		
Continental & Amon Carter, Wasson 7-A-48	1551	5000
Oil Dev. Co., Willard 1-39	370	5080
Hockley County (Duggan-Slaughter)—		
Harry Bass & Dillard, Heffner 4	1027	4998
Bond Oil Corp. - Awoeb Oil Co., Barry 2	657	5013
Mid-Seale 2-A	772	5010
Magnolia, Mallet 4-G	842	5011
Texas Co., Slaughter 13	765	5005
Slaughter 14	855	4985
Pecos County (White-Baker)—		
Cardinal Oil Co., White-Baker 3-E	65	1873
Pecos County (Pecos Valley)—		
Ward-Pecos Pet. Corp., Pecos Valley 6-DE	•	2049
Upton County (Gulf-McElroy)—		
Gulf, Crier-McElroy 45	2306	2858
Yoakum County (Wasson)—		
Aloco Oil Co., Johnson-Texaco 8	691	5278
Basin States Oil Co., Fisher-Walker 5	1112	5214
Humble, Bennett 12	410	5295
Ed Randall 10	473	5115
Oil Development Co., Willard 8-763	422	5270
Willard 9-763	941	5277
Shell Oil, Corder 2	938	5060

Texas Panhandle

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
R. A. Burnett et al, S. B. Burnett 7	28	3083
J. M. Huber Corp., Burnett 13	67	3125
Skelly, Schafer 111	335	3100
Gray County—		
Cities Service, Worley 5	30	3118
Cody-Conner-Crenshaw, Holmes 3	232	3258
Hutchinson County—		
Phillips, Jordan 12	243	2992
Shell, Harvey Sisters 6-B	325	3070
Harvey Sisters 7-B	300	3038

Michigan

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegan County—		
C. W. Cook's Blakeslee 1, se ne se 24-3n-14w	•	1574
Bridger Basin Oil Corp., Harden 1, sw ne se 7-2n-11w	•	1741
N. R. Dodd, Masselink 1, se se se 14-4n-14w	•	1650
Vic Wilson, Meyer 1, se se ne 33-4n-13w	•	1734
S. L. Conant, Russen 1, nw sw sw 28-1n-13w	•	1354
Cass County—		
Silver Creek Oil Co., Wanderlich 1, c e½ se nw 23-5s-16w	•	813
Gladwin County—		
Sun Oil, Tope 1, ne se nw 36-17n-2w	25	3859
Stork Oil Co., Connolly 4, c s½ sw ne 35-17n-2e	•	3570
Kalkaska County—		
Monarch Dev. Co., Antrim Iron Co. 1, c se 16-28-7w	•	1609
Mecosta County—		
Redman Oil Co., Starks 1, se nw sw 13-15n-7w	4	1392
Montcalm County—		
Belvidere Oil Co., Towle 1, nw se sw 12-12n-6w	•	1339
Muskegon County—		
Welsh Oil Co., Cussen 1, sw sw nw 5-21n-16w	5	1840
Ottawa County—		
Southwest Dev. Co., Macauley 1, sw se nw 19-6n-13w	•	1782
Van Buren County—		
Homrich & Kendall, Powers 1, se sw ne 10-1s-14w	•	1305
Lang & Lewis, Inc., Summy 1, ne ne ne 12-1s-15w	100	1198

PREFERRED...
THE OIL WEEKLY
MORE MEN IN THE DRILLING-PRODUCING INDUSTRY SUBSCRIBE TO THE OIL WEEKLY THAN TO ANY OTHER OIL PUBLICATION
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G. B. OGLE, L. S. Ganble and S. F. Glass last week organized Atlas Oil Well Servicing Corporation with an Illinois charter and with headquarters at 319 East Kell Street, Centralia.

WILDCAT REPORT
New Starts and Completions

ARKANSAS
COMPLETION

Clark County—Coker Oil Corp.'s Guess 2, se sw ne 2-11s-20w, sw abnd 676 ft, (logged show of oil).

CALIFORNIA
FIRST REPORT

Fresno County—Texas Co.'s S. P. 27-13, sec 13-17-15, lcn, Cantua Creek area.

COMPLETIONS

Kern County—E. C. Brown's Gibson 1, sec 5-28-29, td 1252 ft in green clay (Walker), Vedder 830 ft, no casing, abnd, Round Mountain area.

KANSAS
FIRST REPORTS

Graham County—Cetal Drlg. Co.'s Hixenbaugh 1, se ne ne 1-6-21w, mim.

COMPLETIONS

Graham County—Cities Service Oil Co.'s Kuehnl 1, ne sw sw 34-9-21w, 3 mi s of Morel pool, top Anhydrite 1760 ft, top Ft. Riley 2520 ft, top Topeka 3370 ft, Lansing 3560 ft, base Kansas City 3765 ft, sandy Conglomerate 3830 ft, cherty Conglomerate 3860 ft, reworked Arbuckle 3934 ft, Arbuckle 3970 ft, abnd 3999 ft.

Greenwood County—Lewis & Dunn et al's Keller 1, c e½ ne sw 22-26-13e, between Toranto and Brinegar pools, new discovery, top Bartlesville 1472 ft, td 1478 ft, 48 bbls 32.5 gr. Harper & Vandeventer's Tollman 1-A, nec 15-28-11e, Severy area, sso 1035, 1134 and 1148 ft, abnd 1301 ft.

Rush County—Patton Drlg. Co. et al's Werth 1, c w½ sw se 10-16-19w, 7 mi se Penny-Wann pool, top Lansing 3380 ft, sso 3400-05, 3425-27 ft, 3444-48 and 3468-70 ft, Oolitic zone 3488-95 ft, no show, base Kansas City 3632 ft, top LaMotte sd 3710 ft, td 3728 ft, set plug 3480 ft, 12 shots 3442-46 ft, no show, 36 shots 3418-25 ft, 2 gals water and sso; shut down 9 hours, 175 ft water with sso, abnd 3728 ft.

NORTH LOUISIANA
FIRST REPORTS

Caddo Parish—L. M. Calhoun's Scott 1, c nw 8-16n-16w, mat.

West Carroll Parish—Phillips & Thornton's Bruce Lbr. Co. 1, sw 15-21n-9e, 7000-ft test, mat.

SOUTH LOUISIANA
FIRST REPORTS

Avoyelles Parish — W. B. Brock et al reentered Snowden 1, Lake Latagnier area, dry hole abnd at 7210 ft, Nov., 1940, for retesting. Sparta 4050 ft, Wilcox 5176 ft.

Evangeline Parish—Bering Oil Co.'s Fruge 1, North Basile pros, sec 10-6s-2w, lcn 10,000-ft test, Golding-Farris Dr. Co., contrs.

COMPLETIONS

Cameron Parish—Shell's Hanszen 8, sec 27-12-6w, nw sd Chalkley fld, flwg 421 bbls 37.2-gr oil daily, tbg press 400 lbs, 7/64-in ch, from 10,080-92 ft.

Terrebonne Parish—Barnsdall's Nelson Dev. Co. 2, sec 3-21s-11e, Point Au Fer Island, abnd 7000 ft in side-tracked hole, original hole dld 11,401 ft.

NEBRASKA
FIRST REPORT

Richardson County—Palensky Bros. et al's Kalous 1, c sw sw 5-2n-13e, dr.

COMPLETIONS

Nemaha County—Krone & Skelly's Morehead 1, c se ne 35-4n-16e, 22 mi se Auburn, top Lansing 918 ft, top Mississippi 2225 ft, Kinderhook 2393 ft, Hunton 2609 ft, core 2638-48, rec 5½ ft, no show, Viola 3333 ft, St. Peter (Wilcox) 3721 ft, Arbuckle 3736 ft, abnd 3770 ft.

Richardson County—Uhri Oil Corp.'s Ogle 1, nw se se 9-1n-14e, 10 mi w Falls City and Ogle pool discovery, Hunton 2258-60 ft, pumped 300 bbls fluid 8 hrs, 98 percent water, abnd 2260 ft. Powers & Stalder's Lee 1, ne nw ne 16-1n-14e, 1 mi s abnd. Ogle pool, top Mississippi 2082 ft, top Hunton 2314 ft, abnd 2341 ft. I. T. I. O. Co.'s Ege 1, c ne se 19-3n-16e, 1 mi ne Shubert pool, top Lansing 904 ft, top Mississippi 2170 ft, Kinderhook 2384 ft, core 2527-37 ft, rec 9 ft green shale, top Hunton 2615 ft, abnd 2651 ft.

NEW MEXICO
FIRST REPORT

Eddy County—Jones-Yates et al's Pickrell 1, ne sw sw 5-19s-26e, sd 200 ft.

OKLAHOMA
FIRST REPORTS

Jefferson County—Hampton-Stelley et al's Pealor 1, c nw ne nw 33-7s-6w, lcn.

Logan County—Hamilton et al's Donoghue 1, c nw se 7-17n-1w, dk.

Osage County—Dillard et al's Osage 1, sw ne nw 32-21n-9e, mim.

COMPLETIONS

Creek County—Trigg et al's Jennings 1, nw sw ne 18-16n-8e, between Red Bank and South Drumright pools, top Hogshooter 1370 ft, Checkerboard 1720 ft, Oswego 2445 ft, Redfork 2836-42 ft, Bartlesville 2946-66 ft, dry; Brown lime 3090 ft, Pitkin 3255 ft, Mayes 3354 ft, Woodford 3580 ft, Misener 3605-15 ft, dry; Sylvan 3615 ft, Viola 3635 ft, Simpson 3668 ft, Wilcox 3700 ft, td 3735 ft, pb 3706 ft, electric log to 3710 ft gave tops at Viola 3633-65 ft, Densmore 3665 ft, Dolomite 3670-83 ft, Wilcox 3687-94 ft, Shale 3694-97 ft, Sand 3697-3710 ft, abnd 3735 ft.

Kay County—Gurley et al's Casemore 1, ne se nw 15-26n-1e, 6 mi nw Ponca City pool, abnd 840 ft.

Okfuskee County—Fain-Porter Drlg. Co.'s Castle 1, ne nw se 36-13n-8e, 2 mi w Mason pool, top Senora sd 1670 ft, Inola 2895 ft, Bartlesville 2935 ft, Brown lime 3120 ft, Gilcrease 3380 ft, Cromwell absent, Pitkin 3530 ft, Mayes 3885 ft, Woodford 4030 ft, Hunton 4040 ft, Sylvan 4080 ft, Viola 4150 ft, Dense 4168 ft, Dolomite 4175 ft, sso, first Wilcox 4189 ft, core 4222-29 ft, dry, abnd 4229 ft.

Pottawatomie County—Hilton Phillips et al's Griffenstein 1, nec nw 22-8n-2e, 8 mi w Romulus pool, Base Pennsylvanian 5040 ft, top Woodford 5080 ft, Hunton 5185 ft, Sylvan 5440 ft, Viola 5535 ft, Densmore 5585 ft, Dolomite 5645 ft, Wilcox 5813 ft, abnd 5839 ft.

Texas County—Roy Starr O&G Co. et al's Joliffe 1, c ne ne 28-3n-19e, cm, water in Dolomite at 2690 ft, increased at 2707 ft, abnd 2717 ft.

NORTH TEXAS
FIRST REPORTS

Baylor County—L. T. Burns et al's Burns 1, sec ne¼ T&NO sec 73, A-320, 3 mi e Fulda, mim for 4500-ft test.

King County—Cannon & J. B. Cunningham's Thorman 1, west cor w½ of W. E. Browder sur, anhydrite 1591 ft, sd 1794 ft.

Montague County—Tom Hunter et al's Barcus-Conoco 1, nec blk 78, Kaufman CSL sur, mim.

COMPLETIONS

Archer County—W. B. Omohundro et al's Coleman 1, SEc blk 52, Coleman sub of Pennington sur, top Bend 5279 ft, top Ellenburger 5918 ft, abnd 5959 ft.

Montague County—Benson & Benson's Joe Benton 1, nec 83½-ac l se, A. A. Lewis sur A-420, top Bend 5718 ft, Simpson 5937 ft, Ellenburger 5980 ft, abnd 6213 ft. Tom F. Hunter et al's Fatheree-Conoco 1, se S. L. Gilliland sur A-1225, top Ellenburger 5003 ft, abnd 5043 ft.

Wichita County—Akin - Dimock - Costley's Dunn 1, 150 ft from s 1470 ft from w tr, W. H. Anderson sur A-1, abnd 1370 ft. Harper-Knappenberger's Ramming 1, 1130 ft from n 1800 ft from w lot 2, H. Hastie sur A-92, abnd 1405 ft.

Wilbarger County—Consolidated Oil Co.'s Cliff Pollan 1, nwc H&TC sec 9, blk 16, trace oil 4247-49 ft, jkd 4575 ft.

WEST TEXAS
FIRST REPORT

Reeves County—C. A. Kitsos et al's Burchard 1, near nec se PSL sec 7, blk 58, sp & sd.

COMPLETION

Ector County—Forest Dev. Corp.'s Edwards 1-B, near ne se nw T&P sec 30, blk 43, T-3-S, elev 3009 ft, anhydrite 1710 ft, base Cowden anhydrite 2650 ft, Yates sand 2900 ft, frosted grains 2930 ft, San Andreas lime 4255 ft, abnd 4400 ft.

EAST TEXAS
FIRST REPORTS

McLennan County—H. Lewis et al's Hander 1, east cor 157.37-ac tr, C. Farnash sur, 2 mi w Waco, abnd 620 ft.

Rusk County—Skelly Oil et al's Marker 1, 205-ac tr, A. Nolen sur, 4 mi sw Mt. Enterprise, lcn for deep test.

COMPLETION

Navarro County—A. J. Willis, Jr.-Coker-Moore et al's Edens 1, 362-ac tr, E. Frier sur, abnd 1465 ft.

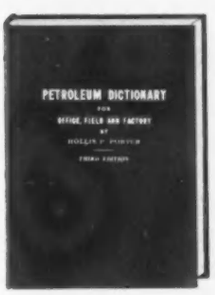
SOUTH TEXAS
FIRST REPORTS

Bee County—W. Earl Rowe & W. C. McBride, Inc.'s Blaschke 1, 202-ac tr, F. Wagenfuch sur, 4 mi s previously drilled well, 3½ mi w Skidmore, 10¾-in csg 600 ft, woc, W. R. Quin, Beeville, contractor.

Duval County—Bridwell Oil Co.'s Rogers 2-D, 120-ac "D" lse, J. Poitevent sur 21, ab 467, 930 ft se Rogers 2-B dry hole, 2000 ft ne Rogers 1-D dry hole, sw of prod, elev 420 ft, 4500 ft test, lcn.

Goliad County—J. O. Nelson et al's Victoria Albrecht 1, 400-ac tr, Manuel Corrions sur, Elmo Reed tr, mi, Lon H. Cron, contractor.

Webb County—J. M. Anderson's Benavides



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COMPLETIONS

Bexar County—W. C. Simpson's Joppick 1, Igino Teyidor sur, 18 mi sw San Antonio, abnd 1410 ft.

Burnett County—Belanger & Rucker's Evans 1, 10 mi se Marble Falls, 2 mi nw Spice-Woods 1400-ac blk, abnd 1200 ft.

Calhoun County—McSpadden Co.'s Clark et al 1, Thomas Hennessee sur, ab 73, ne Coloma Creek, 1 mi ne Hiawatha's Roemer 2, Coronado farmout, 9 mi s Port Lavaca, flowed 65 bbls dist, 3/8-in ch, 2050 lbs tp, 2150 lbs cp, 53 gr, perf 5890-92 ft, td 6240, new fld.

Colorado County—Davis & Co.'s Brownson 1-A, 355-ac tr, E. S. Wooley sur,, ab 584, 2 mi s & w McLane gas producer in Garwood area, 75 bbls 49.2-ga, ¼-in ch, 2450 lbs tp, cp 1550 lbs leaking, td 10,012 ft, opens Wilcox in Garwood area.

Duval County—G. W. Basom's Nueces Ld. & Livestock Co. 1, nw¼, sur 175, ¾ mi sw Munson fld, 17 mi nw Freer, abnd 1227 ft.

Gonzales County—M. M. Kinley's Weber 1, 788-ac lse, Thomas Wright sur, 150-ac tr 3, 1800 ft ne Shell's Weber 1 on tr 1-A, abnd 765 ft.

Jackson County — Mayo & Helmerick & Yayne's Coates 1, James Morgan sur, e bank Lavaca River, Arkansas Fuel farmout, 1 mi se West Ranch, abnd 6505 ft.

Live Oak County—Danciger Oil & Refineries, Inc.'s Lewis 1, 100-ac lse, Thomas Henry sur, ab 14, 2000 ft nw Danciger's S. A. Jt. Stk. Ld. Bk 1, dry hole, 3 mi w Three Rivers, abnd 1800 ft.

McMullen County—Dan Purvis' Nueces Ld & Livestock Co. 1, R. E. Halter sur 26, 7 mi n Munson fld, abnd 795 ft.

Webb County—Seaboard Oil Co.'s Newton 2, C & M Railway Co. sur 1531, 19 mi nw Oilton, abnd 1830 ft.

WEST CENTRAL TEXAS

FIRST REPORTS

Coleman County—Cooper Bros. et al's McClure 1, T. B. Frizzell sur 711, lcn.

Jones County—W. D. Brookover & Hyler Lee's Wimberly 1, swc ne¼ subd 87, Dewitt sur 126, lcn. G. M. Gillespie et al's Young 1, near c ne¼ sec 53, Orphan Asylum Lands, lcn. Shaheen Oil Co.'s Young 1, nec of 120-ac lse, Sam Andrews sur 191, dr 1655 ft.

COMPLETIONS

Jones County—G. M. Gillespie et al's King 1, se ne nw sec 53, Orphan Asylum Lands, abnd 2615 ft. L. H. Pearson et al's Carlson 1, sec nw H&TC sec 1, blk 5, abnd 3501 ft. Snoddy Bros. et al's Jackson 1, J. McGrew sur 245, elev 655 ft, abnd 2472 ft.

TEXAS GULF COAST

FIRST REPORTS

Harris County—H. C. Cockburn and Jack Frazier's Meyer 1, Reuben White sur, Sheldon-Faucet Lake area, lcn 6500-ft Frio test. O. J. McCullough's Swilley 1, Victor Blanco sur, mim. McCullough's Swilley 2, same area, lcn.

COMPLETIONS

Brazoria County—Phillip's Houston Farms Development Co. 1, HT&B sur, 1¼ mi w extension Chocolate Bayou, new sd 9675-77 ft, td 10,006 ft, flowed 283 bbl 54.8-gr distillate dly through ¼- and 3/32-in ch, with tbg/csg press 3200/3200 lbs.

MICHIGAN

FIRST REPORTS

Calhoun County—F. H. Skirvin's Hallock 1, ne sw nw 14-3s-7w, lcn.

Isabella County — Burks White's Ball 1, c w½ ne se 29-14n-4w, rig.

Ottawa County—Muskegon Dev. Co.'s Swett 1, ne sw se 23-13n-16w, rig.

Eaton County — Rex O.&G. Co.'s Hults 1, sw se sw 20-3n-4w, rig.

Clare County—Chapman Oil Co.'s Reber 1, c e½ se nw 3-17n-3w, rig.

COMPLETIONS

Allegan County—C. W. Cook's Blakeslee 1, se ne se 24-3n-14w, Traverse lime 1542 ft, abnd 1574 ft. Bridger Basin Oil Corp.'s Harden 1, sw ne se 7-2n-11w, Traverse 1706 ft, abnd 1741 ft.

Cass County—Silver Creek Oil Co.'s Wonderlich 1, c e½ se nw 23-5s-16w, Traverse 807 ft, abnd 813 ft.

Kalkaska County—Monarch Dev. Co.'s Antrim Iron Co. 1, c se 16-28n-7w, Antrim 770 ft, Traverse 1541 ft, abnd 1609 ft.

Muskegon County—Welsh Oil Co.'s Cussen 1, sw sw nw 5-21n-16w, Traverse 1829 ft, td 1840 ft, after acid & shots 5 bbls on pump, new field.

Ottawa County—Southwest Dev. Co.'s Macauley 1, sw se nw 19-6n-13w, Traverse 1724 ft, abnd 1782 ft.

P. E. FITZGERALD, of Dowell Incorporated, Tulsa, recently discussed "Mud Chemicals and Acid Treatment of Oil Wells" before the Louisiana State University student chapter of the American Institute of Mining & Metallurgical Engineers.

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MEN IN THE INDUSTRY'S NEWS

DAN J. HARRISON, president and director of Harrison Oil Company, Houston, last week was named by Governor W. Lee O'Daniel to the board of regents of the University of Texas. Harrison, a former student of the university, practiced law in Liberty County before entering the oil business in 1918. He was district attorney for the Seventy-Fifth Judicial District for four years, and has been a vice president of the Texas Ex-Students Association and state chairman of that organization's athletic finance committee.

W. J. RHODES, Breckenridge, president of the West-Central Oil & Gas Association, last week named chairmen and personnel of the group's seven standing committees.

C. W. Hoffman, Eastland, is chairman of the proration-legislative committee, with Joe A. Clarke, Albany, immediate past-president of the association, as vice chairman. Jack B. Roberts, Breckenridge, heads the tax committee; R. L. Pensler, Cisco, the safety and accident-prevention committee; J. C. Sandefer, Jr., Breckenridge, constitution and by-laws committee, and E. W. Moutray, Abilene, anti-theft committee. F. A. Dunigan, Breckenridge, is chairman of the membership and finance committee, and J. E. Whiteside, Brownwood, is vice chairman. Rhodes, as president, heads the executive committee.

B. A. HARDEY, Shreveport oil operator, who since last May has acted as Louisiana Conservation Commissioner, will become a member of a three-man board of minerals, provided for under the reorganization act.

LYLE C. HARVEY, general manager of Bryant Heater Company, Cleveland, and a director of Dresser Manufacturing Company, Bradford, Pennsylvania, has been named second vice president of the Association of Gas Appliances & Equipment Manufacturers.

G. DONALD SPACKMAN has been appointed general manager of Lukens Steel Company and its subsidiaries, according to Robert W. Wolcott, president. Spackman was born June 29, 1895, at Coatesville, Pennsylvania, and attended Coatesville High School and Swarthmore College, graduating from the latter in 1917 with a B.A. degree. His mechanical engineering degree was awarded in 1924 by Swarthmore College. In 1919, he joined Lukens Steel Company, serving in the mechanical department and handling steam, hydraulic and combustion problems. In December, 1920, he was appointed fuel engineer, serving in that capacity until August, 1925, when he was appointed superintendent of the flanging department. In 1929, he was appointed assistant general superintendent. When the Lukenweld Division was formed in May, 1930, he was elected president, and in 1936 was appointed general superintendent of Lukens Steel Company.

J. B. KISSINGER, auditor of Oil Well Supply Company's California division, retired December 31 after 45 years of service with the company. He started with the company at Oil City, Pennsylvania, in 1895. Since 1909, he has been connected with the company's Pacific Coast activities, headquartering in Los Angeles.

J. W. GARDNER, board chairman of Gardner-Denver Company, was recently honored on completion of 60 years service with the company by an award of a gold, diamond-set watch-fob model of a steam governor. He joined the company founded in 1854 by his father, the late Robert W. Gardner, as a boy of 17, starting as an apprentice machinist. His service includes nearly 30 years as president, and in more recent years, as executive committee chairman and board chairman.

JOHN E. VAN DALL, Magnolia Petroleum Company, has been elected president of the Oklahoma City Geological Society. Clyde E. Dorr, consulting geologist, was named vice president, and Graydon H. Laughbaum, Sinclair Prairie Oil Company, secretary-treasurer.

ANTHONY F. KEATING, Tulsa, has purchased Robey Drilling Company and the firm name has been changed to Robey-Keating Drilling Company. Home office will remain in Tulsa, with a district office at Salem, Illinois. Fred McAlpine continues as drilling superintendent.

MAURIE WALTERS, Michigan division superintendent for Sohio Corporation the past two years, has been named general superintendent of Sohio Pipe Line Company, established three weeks ago after Standard Oil Company of Ohio purchased 100 percent ownership of the former Michigan-Toledo Pipe Line Company.

FRANK L. HERLE and Joel H. Hirsch, formerly with deFlorez Engineering Company, New York City, have announced opening of a consulting engineering partnership under the name of Herle & Hirsch, with offices in the Wheeler Kelly Hagny Building, Wichita, Kansas.

W. D. NOEL, J. B. Tubb and M. H. McWhirter last week organized Trebol Oil Company as a Texas corporation with headquarters in Monahans.

H. H. WILSON, sales manager of Frick-Reid Supply Corporation, Tulsa, has been made a vice president, with headquarters shifted from Tulsa to Houston. He entered services of the company in July, 1920, at Tulsa, served in several branch stores, and for a number of years was manager of the company's office at Dallas. He had been sales manager since June, 1938.

Rainey Elliott, former manager of the company's Dallas office, who entered the employ of the company in January, 1935, has been named to succeed Wilson as sales manager. He will transfer his headquarters to Tulsa.

H. L. Wilkins, former general district sales manager with headquarters at Mount Vernon, Illinois, has been named manager of branch stores. To be located at Tulsa, he entered services of the company in July, 1919.

F. J. Kopp, former Panhandle district sales manager has been named manager of the Dallas and Fort Worth offices, and stores formerly in the Panhandle district have been placed in the Southern Oklahoma-North Texas District under H. D. Stanley, sales manager at Wichita Falls.

J. W. Kane, former Gulf Coast assistant district manager, has been made sales manager of the company's new Southwest Texas district, with headquarters at San Antonio; U. G. White, Jr., Mt. Vernon, Illinois, has been named Illinois-Kentucky district sales manager, and R. R. Boyer, Mt. Pleasant, has been named Michigan district sales manager.

L. MOSELEY MOFFITT, oil operator, was elected president of the Shreveport Chamber of Commerce for 1941. He is immediate past president of the Louisiana-Arkansas Division, Mid-Continent Oil & Gas Association.

GEORGE RINCK, assistant Eastern sales manager for Caterpillar Tractor Company, Peoria, Illinois, has been named Eastern sales manager, succeeding Henry M. Hale, resigned. Kenneth Cox is taking over Rinck's former duties.

W. F. KNODE, a senior member of the firm of Foran, Knode, Boatright & Dixon, consulting petroleum engineers of Houston and Calgary, Alberta, Canada, has resigned to enter private consulting work, and has established headquarters in Corpus Christi. For the past three years he has been located in Calgary, where he was instrumental in organizing the Alberta Conservation Board to institute conservation in Alberta fields, being chairman for the first year and acting in a consulting

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MEN IN THE INDUSTRY'S NEWS

capacity since that time. He was graduated in mining engineering from the University of West Virginia in 1921, was chief engineer of the oil and gas division of the Texas Railroad Commission from 1931 to 1934, and has specialized in production engineering problems in South Texas oil and gas fields since that area first entered the major development stage.

W. G. SKELLY, president of Skelly Oil Company, Tulsa, was awarded a certificate of merit by the Tulsa Chamber of Commerce for outstanding civic service during the past year. Others who received similar awards for various services are: Mark S. Patton; R. Elmo Thompson, executive vice president, Sunray Oil Company; Gerald H. Westby, president Seismograph Service Corporation; J. L. Shakely, president, Frick-Reid Supply Corporation; J. S. Hawley, Stanolind Oil & Gas Company; Waite Phillips; Edward C. Lawson; Rush Greenslade, vice president and general manager, Gulf Oil Corporation; R. Otis McClintock, president, First National Bank & Trust Company; N. R. Patterson, Patterson Steel Company; M. J. Flanagan, vice president, Gaso Pump & Burner Manufacturing Company; A. E. Bradshaw, president, National Bank of Tulsa; F. B. Parriott, and P. H. Bohart, vice president, Gulf Oil Corporation.

BRUCE BARKIS, of B & W, Inc., Houston, discussed the importance of cleaning a well and centering the casing in cementing before the Petroleum Engineering Club of A. & M. College of Texas January 7. The club has adopted a key with a raised replica of a derrick in the center, with the words, "Petroleum Engineering" and "Texas A. & M." in raised letters.

CHARLES WELLS, scout for The Carter Oil Company, has been named by the Chief Scouts Association as czar for the Wichita, Kansas, district. Others named include Roy Dunlap, Sun Oil Company, for Enid district; Jack Lander, Pure Oil Company, Shawnee district, and M. J. Hizie, Gulf Oil Corporation, for the Ardmore district.

J. U. TEAGUE, superintendent for Hogg Oil Company of Houston, addressed the Mid-Continent Section of the American Institute of Mining & Metallurgical Engineers at Tulsa January 13 on "Economics of Control of Oil Produced with Water."

JAMES B. BOND, 54 East Texas field producer and drilling contractor, died January 12 at Longview, Texas, where he had resided the past 10 years. He was a native of Ruston, Louisiana, and operated in Arkansas prior to discovery of the East Texas field.

DR. H. B. STENZEL, of the Texas State Bureau of Economic Geology, will address the luncheon meeting of the Houston Geological Society, January 23, on "Surface Relations of the Carrizo Sand." The meeting will be held on the mezzanine floor of the Texas State Hotel.

M. E. MONTROSE, general sales manager for Lane-Wells Company, has been elected a vice president, according to Walter T. Wells, board chairman. He was the company's first Mid-Continent Division manager, and organized activities in the Mid-Continent, Rocky Mountain and Eastern fields. He later moved to Houston as the company's Gulf Coast Division manager, and in 1939 was transferred to Los Angeles and made general sales manager. He was named a director in 1938. Before joining Lane-Wells Company, Montrose was with General Electric Company for 14 years.

GLEN RUBY, former chief geologist for Y. P. F., discussed "Three Years Working in the Argentine" before the Los Angeles Basin Chapter of the American Petroleum Institute's Division of Production January 14. A round table discussion of "Practical Production Problems" was presented with W. J. Larson, production superintendent for Union Oil Company, as moderator. Participants were J. F. Gilstrap, California Production Service Company; Paul Andrews, production engineer for Signal Oil & Gas Company; A. F. Wilson, production foreman for Standard Oil Company, and W. A. Werts, production superintendent for Hall-Baker Company.

HAROLD B. FELL, executive vice president of the Independent Petroleum Association of America, discussed "Federal Legislation Facing the Oil Industry" before a luncheon meeting of the organization on January 13 at Oklahoma City. Frank Buttram, president, discussed "The Present Trend of the Industry."

T. E. WEIRICH, Phillips Petroleum Company geologist, addressed the Shreveport Geological Society Thursday, January 16, "Comparative Geology of the Cincinnati Uplift."

JAMES F. LINCOLN, president of Lincoln Electric Company, Cleveland, discussed "The Position of Welding in Industry" before the Houston Engineers Club last week.

GEORGE B. CORLESS, Gulf Coast division superintendent for Humble Oil & Refining Company, Houston, recently discussed "Obtaining and Holding an Engineering Position" before the Student Section of the American Institute of Mining & Metallurgical Engineers at the University of Texas.

JIM NASH, production department engineer for The Carter Oil Company, Tulsa, resigned January 10 to join Reno Oil Company, Wichita Falls, as evaluation engineer.

NOTES FOR THE Equipment Buyer and User

Bit

UNIVERSAL ENGINEERING COMPANY

A differential drilling bit designed to use three compound motions, down, side and up, has been announced by Universal Engineering Company, 2369 East 51 Street, Los Angeles.

Designed by John A. Zublin, the tool employs a hard-faced heat-treated alloy cast steel shank fitted with a wheel that carries nine barrel-shaped roller cutters, four wide and five narrow, each having three discs or three rows of saw teeth, according to the character of the formation. Three sets of gauge rollers control the size of the hole.

By inclining the plane of the roller carrier at an angle of 15 degrees with the axis of the drill pipe, a non-concentric rotation of the cutting edges avoids tracking and dead centers. Three differential motions result from the rotation of the shank on the drill pipe together with the rotation of the roller carrier and the rotation of the rollers in the carrier. These motions cut spiral criss-cross paths in a spherical bowl at the bottom of the hole. For every 4¾ turns of the drill pipe, the carrier wheel makes one revolution and cuts 18 spirals crossing at an angle of 30 degrees in the formation.

The bit has two interchangeable water nozzles, of which the upper one cleans the bit and the lower one flushes the hole. Clearance around the shank permits the fluid stream to wash the cuttings away from below, between and around the rollers, preventing them from packing.

The tool has from one half to one tenth the weight of other bits. Constant shift in the position of the cutter teeth in the bottom of the hole is designed to permit light-weight drilling to a high degree.

Two types of rollers are employed, disc rollers for sanding, sticky, formations, and saw-tooth rollers for hard formations. They are identical in overall dimensions, and wheels of both types are interchangeable.

Recommended drilling speed is from 200 to 400 revolutions per minute with fluid circulation up to 2000 gallons per minute, but normally between 500 and 800 gallons per minute. For fluid volumes less than 500 gallons per minute, nozzles may be adjusted to smaller orifices to produce greater velocity.

Lathes

South Bend Lathe Works, South Bend, Indiana, has issued a new general catalog of 112 pages with over 240 illustrations. It shows 50 different sizes and types of back-geared, screw-cutting lathes for manufacturing, tool room and general shop work. Sizes of lathes illustrated are 9-, 10-, 13-, 14½-, 16- and 16-24-inch swing. Each size is shown in several different models with motor drive and countershaft drive, in quick change gear and standard change gear. New items shown include the Model "A" 9-inch workshop tool room lathe; 10-inch swing 11/16-inch collet series "S" lathes, and the 10-inch swing 1-inch collet lathes.

Pumping Jacks

THE NATIONAL SUPPLY COMPANY

A line of pumping jacks, designated Type E and built in three sizes, with rated polished-rod capacities of 10,000, 12,000 and 16,000 pounds, has been announced by The National Supply Company, Toledo, Ohio.

A true-arc hanger is designed to provide a straight lift to contribute to longer wire-line wear and lower maintenance costs. A minimum ratio of 1/1 provides a short stroke often desirable, and longer stroke requirements can be met if necessary.

Needle-type, oil-bath, anti-friction bearings, which are self-aligning, dust-proof and oil-tight, have been provided to reduce power requirements, to aid in lubrication, and to prevent excessive wear. Adjustment and self-alignment features have been designed to contribute to maintenance of operating economy and efficiency.

A pyramidal-type frame has been provided that does not require use of extra braces, and designed to practically eliminate possibility of deflection or misalignment under load. Steel castings, welded into the frame at the four areas of foundation contact, are designed to provide increased stiffness and a wide foundation bolt spacing at those points.

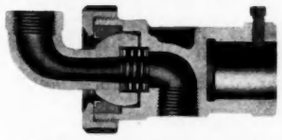
The jacks are fabricated from structural steel and steel castings by electric welding.

Swivel Joint

BARCO MANUFACTURING COMPANY

A swivel joint rated for pressures to 1500 pounds and providing for a 360-degree movement around an axis at right angles to the inlet and outlet, has been announced by Barco Manufacturing Company, 1801 Winnemac Avenue, Chicago.

Designated Type 7KS-8BS, it is available in pipe sizes from ⅜- to ¾-inch. A socket-equipped body is employed that permits the coupling to be anchored in position. The device is designed for use with oil, water, air, gas and steam without leakage under alternating high and low temperatures.



Barco's Type 7KS-8BS Swivel Joint

Packings

THE B. F. GOODRICH COMPANY

Two types of sheet packing, one made of Ameripol, synthetic rubber developed after 14 years of research, and the other of Koroseal, synthetic elastic material, have been announced by The B. F. Goodrich Company, Akron, Ohio.

The Ameripol product is a dark packing designed to resist action of oils, heat and cold, and to resist water absorption. Tensile strength is approximately 1500 pounds, elongation 400 percent, and Shore durometer hardness 78 to 92. It is made to order only in 100-pound rolls, approximately 36 inches wide in thicknesses from 1/32- to ¼-inch. A square yard of the 1/16-inch size weighs approximately 4¾ pounds.

Koroseal packing is designed to resist action of oils and solvents, and of some

The National Supply Company's Type E Pumping Jack

BARGAIN

for quick sale

40,000 FEET

NEW ONE INCH

DRILLING LINE

PLOW AND IPS,

Manufactured by

API—LICENCEE

Will sell any lengths

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HOUSTON

TIN END ENVELOPES

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Made of strong kraft paper, tightly sealed to eliminate leaks. Top end folds over with easy twist and holds contents securely. Most economical for sending and filing of sand samples. Phone, write or wire for our low prices.

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HOUSTON, TEXAS

NOTES FOR THE Equipment Buyer and User

corrosives. Tensile strength is about 2200 pounds, elongation 300 percent, and Shore durometer hardness 73 to 77. It is furnished in 26x36-inch sheets, with the 1/32-, 1/16-, ⅛- and 3/16-inch sheets carried in stock and other thicknesses made to order.

Otis Uses Kennametal for Regulator Valve Parts

Otis Pressure Control, Inc., Dallas, announces employment of Kennametal inserts in valves and seats in its bottom-hole regulators to withstand abrasive action of flow against these parts.

Kennametal is an intermetallic compound corresponding to the formula $W_2Ti_2C_4$, rating 89-91 Rockwell A in hardness, and with strengths of 200,000 to 300,000 pounds in transverse rupture test. Modulus of elasticity is about 58,000,0000 pounds.

Use of Kennametal in bottom-hole regulators follows its successful use in the company's shop to machine K-monel, chrome-molybdenum and nickel-molybdenum alloys. It permitted faster cutting of the tools.

Blackmer Pump Company Announces Plant Addition

Contracts for an addition to its plant and office building have been awarded by Blackmer Pump Company, Grand Rapids, Michigan, according to N. J. Harkness, executive vice president.

The new addition will double the engineering department space, increase office facilities, and add somewhat to the testing and production departments. The building will be of brick and concrete construction, to harmonize with the present buildings. Contract calls for completion, ready for occupancy, by March 1.

Lane-Wells Opens New Offices In Illinois and Oklahoma

Lane-Wells Company has opened branches at Olney, Illinois, P. O. Box 348, Telephone 844, and at Ardmore, Oklahoma, 321 Simpson Building, Telephone 751, according to M. E. Montrose, general sales manager.

Lane-Wells Officials Meet For Annual Sales Convention

Plans for an aggressive sales campaign in 1941 were made when officials of all Lane-Wells Company divisions met in Los Angeles January 13 to 17 for their annual sales convention, according to Rodney S. Durkee, president.

Convention activities were directed by M. E. Montrose, vice president and general sales manager. The company's Gulf Coast division was represented by Morton T. Higgs, division manager, and J. E. Huff, Jr., in charge of division sales; R. B. McCullar, division manager, and Chas. T. Casebeer, division sales manager, represented the Mid-Continent division, and California representatives were J. W. McPhee, division manager, and D. M. Anderson, division sales manager. J. Murray Walker attended from Okotoks, Alberta, Canada.

Homco Acquires Fullgage Reflecting Tool Company

Houston Oil Field Material Company, Houston, announces it has purchased Fullgage Deflecting Tool Company. The latter company for several years has been engaged in the manufacture of deflecting tools and has maintained directional drilling service organization.

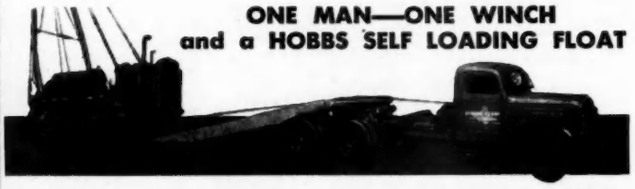
The Homco Cutting and Fishing Tool Division will retain the experienced directional drilling engineers of the Fullgage company as a nucleus for a new and larger directional-drilling department. The deflecting tools will be manufactured in the company's new plant on Wayside Drive in Houston, and will be available on a service basis similar to that of cutting and fishing tools.

Pressure and Vacuum Valves

The Vapor Recovery Systems Company, 2820 North Alameda Street, Compton, California, has issued Bulletin M-3, "Pressure and Vacuum Valves and Safety Devices for Tank Ships." It illustrates and describes the company's complete line of gas-control and safety equipment to handle petroleum products aboard tank ships and barges, and gives engineers' plan and elevation drawings of each product with dimensions, specifications, net and shipping weights, and prices. Illustrations of typical installations aboard tankers and barges are featured.

HOBBS SELF-LOADING FLOAT

ONE MAN—ONE WINCH and a HOBBS SELF LOADING FLOAT



The above picture shows the actual loading of a 26,000 lb. caterpillar "60" complete with winch and gin poles, by ONE MAN—A WINCH—and a HOBBS SELF LOADING FLOAT. The winch pulls the load up on the float. ECONOMICAL—SAFE—FASTER TO LOAD AND FASTER ON THE ROAD. They'll make more miles and more dollars per hour.

Refer to Pages 1052-1054 Your Composite Catalog

HOBBS MANUFACTURING COMPANY

FORT WORTH . . SAN ANTONIO . . HOUSTON . . LUBBOCK

REGISTERED PROFESSIONAL ENGINEERS

Air • Gas • Water

REPRESSURING

RECYCLING • PRESSURE MAINTENANCE

INSTALLATION • OPERATION

PETROLEUM ENGINEER

JO H CABLE

WICHITA FALLS TEXAS

GAS MEASUREMENT • PERMEABILITY
COMPRESSOR PLANTS • POROSITY
BOTTOM HOLE PRESSURE • SATURATION
GAS OIL RATIOS • RECOVERABLE OIL

CONTROL OF FLOW THRU FORMATION

REGISTERED PROFESSIONAL ENGINEERS

Squeaks from the Bull Wheel

Different Species

When the new recruit arrived at his unit the officer examined his papers, and said: "I see you're described as a carrier. I suppose you drive a motor lorry?"

"No, sir."

"What then? A horse and cart?"

"No, sir."

"Then what kind of a carrier were you?"

"Typhoid, sir."

Doubling His Savings

Sandy was all smiles when he returned home.

"What's the news?" asked his wife, puzzled.

"Wonderful, lassie," said the Scotsman. "I've just heard that next week they are going to put the local paper up to two pennies."

"Oh, mon, have ye gone daft?" asked his wife. "Why, there's nothing to rejoice about in that."

"Oh, yes, there is," Sandy went on. "Ye ken that when I used to go to the free library to look through it, I used to save a penny; now I shall save two pennies."

Backfire

I wonder if you would be so kind as to weigh this package for me?

Why, certainly; it weighs exactly three and a quarter pounds.

Thank you. It contains the bones you sent me in that four-pound roast yesterday.

Departed Suddenly

A ventriloquist attended a negro funeral unknown to the mourners. Afterward, one of them told another what had happened at the cemetery.

"You won't believe it, Mose," the narrator said, still wild-eyed, "but when dey begins to lowah Joe in his grave, he says, 'Lemme down easy, boys.'"

"And did dey finish burying him?"

"Man, Ah don't know. Ah didn't stay."

Expert Appraiser

Do you recall whether the defendant was expensively garbed?

She sho' was, Mistah Lawyah, and' Ah knows 'spensive garbage when Ah sees it.

Progress

So you are building a new house. How are you getting on with it?

Fine. We've got the roof and the mortgage on it, and we expect to have the furnace and the sheriff in by Christmas.

Facts of Life

Jack Bean—Mama, tell me, where did I come from?

Mama Bean—Hush, dear, the stalk brought you.

Mind Reader

A prospective customer entered an art shop.

"I want to see some of those pictures that are done by scratching," he said to the clerk.

The clerk thought a moment, and then his face lighted up.

"Oh, yes," he said, "you mean itchings."

A Good Suggestion

A stranger applied at the police station for lodgings, and when asked his name, replied that it was Smith.

"Give me your real name," he was orderer.

"Well," said the applicant, "put me down as William Shakespeare."

"That's better," the officer told him. "You can't bluff me with that Smith stuff."

Different Technique

I certainly have been pinched for money lately.

What a strange way of getting it. My wife kisses me when she wants money.

Well Defined

Willie, how do you define ignorance?

It's when you don't know something and someone finds it out.

Wings for One

"Well, I got the license today."

"OH, GEORGE!"

"I mean my pilot's license."

"Oh, George."

Condensed

What are the twins called?

Henrietta.

Not both the same name?

Certainly not. One Henry and the other Etta.

Her Hero

Hubby (on hearing burglars in the house)—Sh-h, dear. This is going to be a battle of brains.

Wifey—How brave of you, dear, to fight unarmed.

Oversight

Whar am Rastus terday, Marcellus?

In de hospital.

In de hospital; what happened to him?

Oh, he jest came down de ladder about ten minutes aftah it had been took away.

At Certain Times

Has anyone a question to ask?

Yes, ma'am. Can a short sighted person have a far-away look in his eyes?

Fifty-Fifty

Who's boss at your house?

Well, my wife and I share the job. She bosses the children and me; I boss the goldfish.

New Angle

Well, boss, I've got a perfect news story.

The man bit the dog?

Naw, the bull threw the salesman.

They Need One

A scientist says here that "man may again grow a tail as useful as a hand if the need arises.

Say, that guy must have been watching a trap drummer in a swing band.

Good Reason

"Marse Govenah, I suttenly does want my Sam pardoned."

"Where is he, auntie?"

"Out at de pen."

"What is he in for?"

"Stealin' hams."

"Did he steal them?"

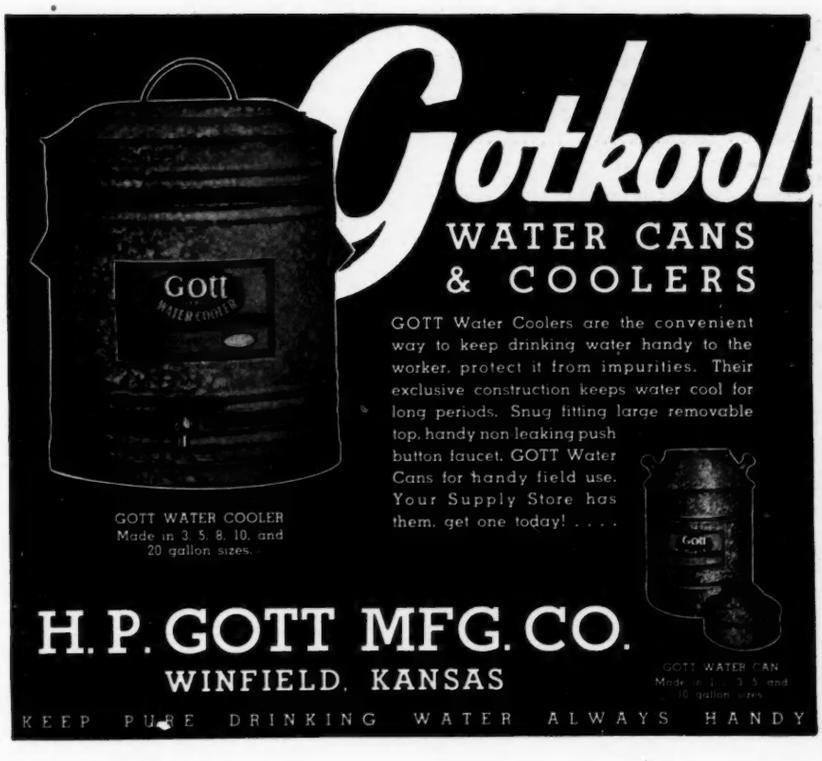
"Yes, sah, he sho' did."

"Is he a good boy, auntie?"

"Lawdy, no sah; he's a turble wuthless, no 'count boy."

"Then why do you want him pardoned?"

"Cause, sah, we's plumb out of ham ag'in."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& COOLERS
GOTT Water Coolers are the convenient way to keep drinking water handy to the worker, protect it from impurities. Their exclusive construction keeps water cool for long periods. Snug fitting large removable top, handy non leaking push button faucet. GOTT Water Cans for handy field use. Your Supply Store has them, get one today! . . . .
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KEEP PURE DRINKING WATER ALWAYS HANDY

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Time is Money . . .

SAVE BOTH BY STRAIGHTENING KELLYS AND DRILL PIPE WHILE THEY ARE SUSPENDED IN THE DERRICK by using a

IT'S PORTABLE

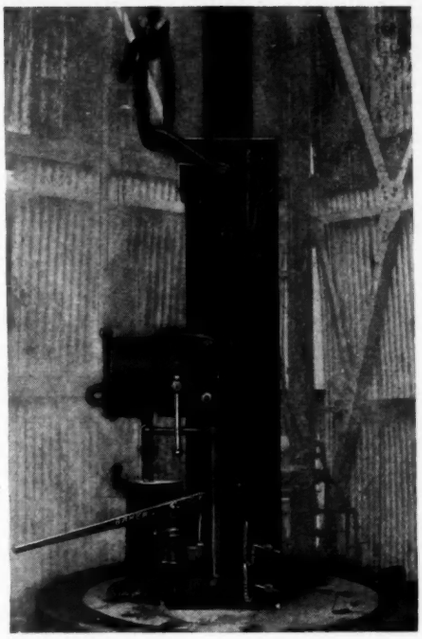
IT'S HYDRAULIC IN PRINCIPLE

IT'S EASY TO OPERATE

IT'S EFFICIENT

IT'S ECONOMICAL

Send today for complete details, or refer to the Baker Section of your Composite Catalog.



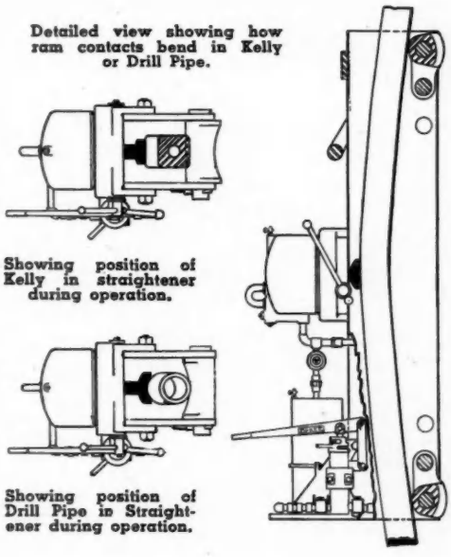
BAKER PORTABLE HYDRAULIC KELLY and PIPE STRAIGHTENER

STRAIGHTENING IS EASY AND ECONOMICAL . . .

The Baker Kelly Straightener is an easily operated device, utilizing the principle of the hydraulic ram, applying the force built up by manually operated pump to the bend in the Kelly, drill collar, or drill pipe as it hangs suspended in the derrick.

COMPLETELY PORTABLE

The entire unit is completely portable (weighing only 1200 pounds), and can easily be transported to the well on a small "pick-up" truck or trailer and set up on the rotary table by means of the cat line.



Detailed view showing how ram contacts bend in Kelly or Drill Pipe.

Showing position of Kelly in straightener during operation.

Showing position of Drill Pipe in Straightener during operation.

ADVANTAGES OF STRAIGHTENING AT THE WELL . . .

Even though shop facilities may be close at hand, there are a number of important advantages in straightening at the rig—advantages that result in substantial savings in time and money. Probably more Kellys are bent during transportation and in being laid down and picked up than from any other cause. Frequently a Kelly that has just been straightened will again be bent during the process of transporting it back to the well, rolling it off the truck and dragging it into the rig.

When the BAKER KELLY STRAIGHTENER is used, the job is done right on the rotary table with the Kelly hanging in its normal position. The hazards involved in transportation and handling are entirely eliminated as are also the cost of transporting the Kelly to and from the well, plus the time and expense entailed in removing and replacing it. In foreign or isolated fields, however, the Baker Kelly Straightener is considered indispensable as the cost and loss of time involved in transporting a bent Kelly or drill pipe to and from a distant shop makes it a serious matter.

CAN BE ADAPTED for HORIZONTAL PIPE STRAIGHTENING OPERATIONS

By the attachment of a simple, easily installed device, the Baker Kelly Straightener can also be adapted for efficient, horizontal pipe straightening work. The same high efficiency and portability is maintained, plus the advantage of being able to utilize the Straightener for a wide variety of pipe straightening operations around the field and in the shop.

BAKER OIL TOOLS, INC.

MAIN OFFICE AND FACTORY: 6000 So. Boyle Ave., Los Angeles, Calif., Box 127, Vernon Station
Central Division Office and Factory: P. O. Box 3048, Houston, Texas
Export Sales Office: 19 Rector Street, New York City

How Would You Grip Wire Rope?

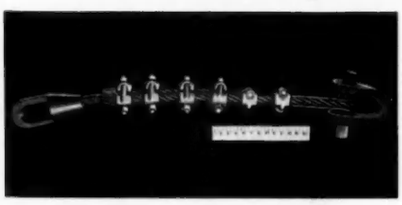
FINGER PINCH...?

Cuthbert can't do any better. The U-Bolt Clip he uses crimps and spoils the rope, causes delays and dangerous accidents. Would you hire Cuthbert to do a man-sized job?

OR FIST GRIP...!

"Here's the way to grip wire rope," says the Man On The Job. With a real fist grip! No delays, spoiled rope or accidents! It costs less to use Laughlin Safety Clips!"

CLIPS HOLD AT 88 TONS LOAD



Dramatic, competitive tests. A world-famous laboratory, a U. S. Government arsenal, and a leading wire-rope manufacturer tested the Laughlin drop-forged Safety Clip. They found it twice as strong —delivering over 95% of rope strength. An assembly of six Safety Clips held 88 tons load! Result: *fewer clips needed.*

THIS FREE FOLDER DESCRIBES THE TESTS

and proves money-saving features like these

SAVES TIME Bolts on opposite sides. Can't be put on backwards. Easy to apply, tighten and remove. Fewer delays from rope breaks.

SAVES ROPE Flat bearing surfaces grab strands and stay put without unlaying them.

WRITE US TODAY USING THIS COUPON

THE THOMAS LAUGHLIN CO.
PORTLAND, MAINE

Please send me free Safety Clip booklet, W-1

NAME .....

COMPANY .....

ADDRESS.....

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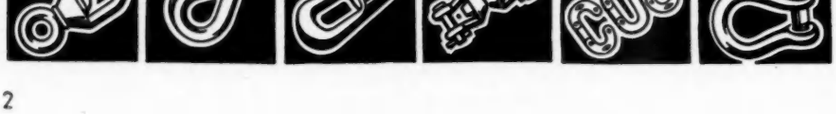

Looking Ahead

WITH THE EDITOR

THE EAST TEXAS OIL PROVINCE was electrified late in 1940 by the discovery of a major oil reserve in and near the little town of Hawkins, Southeast Wood County, Texas. Location is about 15 miles west of the Gladewater section of the East Texas field, but entirely different structural conditions accounted for the two oil accumulations.

Production at Hawkins comes from the Woodbine sand, well known for its porosity and permeability, but the oil is a 28-29-gravity, black, asphalt-base product similar to that produced at Cayuga from the same formation. It is none the less important, since oil of this type makes a good fuel stock that is in good demand now.

Three to Six Hundred Million

With an indicated producing area of 8,000 to 10,000 acres and from 25 to 150 feet of actual oil sand in the 450-foot Woodbine section, the field seems to be a reserve of 300 to 600 million barrels. The discovery is recognized as one of major importance because of the favorable location of the field, the ease with which development may be completed, the firm demand for fuel oil, and the large number of wells in line for completion this year.

An evaluation of the discovery based on salient features of the Woodbine sand alone is enough to guarantee a substantial production of oil over a long period.

More Wildcats

The discovery has touched off a leasing campaign along a 75-mile strip between Mt. Pleasant and Cayuga, and several wildcats will be drilled to test promising structures over a wide area.

THE OIL WEEKLY next week will present a story on the Hawkins discovery, based on activity to date and indicated developments of the future.

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